

BUDGETARY EFFICIENCY IN TURKEY:  
LOCAL – CENTRAL  
GOVERNMENT RELATIONS FROM THE  
PERSPECTIVE OF FISCAL FEDERALISM

The Institute of Economics and Social Sciences of Bilkent University

by

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# ABSTRACT

## BUDGETARY EFFICIENCY IN TURKEY: LOCAL –CENTRAL GOVERNMENT RELATIONS FROM THE PERSPECTIVE OF FISCAL FEDERALISM

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The role and the functions of different levels of government are controversial issues. Together with increasing the importance of the local governments, decentralization has also gained importance. In this study, we examine local-central government relationships in Turkey, which has a strongly centralized government structure, by inspecting the status of decentralization. We empirically investigate the critical points mentioned in traditional fiscal federalism theories by using a provincial data set. Our study briefly reveals that there has not been a trend toward expenditure decentralization in Turkey. Although a slight trend toward tax decentralization is observed, local governments in Turkey do not have ability to improve their own revenues. In addition, we do not see any significant compensatory policy of the central government against the shocks realized in the macroeconomic environment. A supporting policy of the national government is observed in the priority regions for development and in agricultural regions. Finally, our study on social indicators showed that there are significant uneven distribution of health facilities and inequalities among different income groups. In education case, we observe that education facilities are more even across provinces as compared to health facilities.

Keywords: Decentralization, fiscal federalism, local governments and budgetary efficiency.

# ÖZET

## TURKİYE’DEKİ BÜTÇE VERİMLİLİĞİ: MALİ FEDERALİZM AÇISINDAN YEREL VE MERKEZİ YÖNETİM İLİŞKİLERİ

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Günümüzde farklı seviyedeki devlet yönetimlerinin rolleri ve fonksiyonları çok tartışılmaktadır. Yerel yönetimlerin önemi hızla arttığından dolayı, yerelleşme de günden güne önem kazanmaktadır. Bu çalışmada, yerelleşme konusunu gözönüne alarak, güçlü bir merkezi yönetim sistemine sahip olan Türkiye’deki yerel ve merkezi yönetim ilişkilerini inceledik. İl bazında bir veri kümesi kullanarak, geleneksel mali federalizm teorilerinde vurgulanan önemli noktaları yakalamaya çalıştık. Çalışmamızın önemli bulguları şunlardır: Türkiye’de harcamaya yönelik önemli bir yerelleşme eğilimi yoktur. Buna karşın, vergi yerelleşmesine yönelik zayıf bulgular elde etmemize rağmen, Türkiye’deki yerel yönetimlerin temelini oluşturan belediyeler özkaynaklarını arttırma kabiliyetine yeterince sahip değildir. Ek olarak, merkezi yönetimin ekonomide gerçekleşen şoklara karşı gerekli mali politikaları üretemediğini gözledik. Merkezi yönetimin kalkınmada öncelikli yörelerde ve tarımsal bölgelerde destekleyici rol oynadığını gözledik. Son olarak, sosyal göstergeler üzerindeki çalışmalarımız sağlık imkanlarının dağılımında önemli eşitsizlikler ve değişik gelir düzeyi grupları arasında sağlık imkanları açısından büyük farklılıklar olduğunu ortaya koymuştur. İller bazında incelendiğinde, eğitim alanında, sağlık imkanlarına nazaran daha adil bir paylaşım ve dağılım olduğunu gözlemledik.

Anahtar Kelimeler: Yerelleşme, mali federalizm, yerel yönetimler ve bütçe verimliliği.

To My family

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# Chapter 1

## Introduction

The role and the functions of different levels of the government are controversial issues. However, it is commonly viewed that the government structure should be handled and contemplated carefully in the light of federalism and decentralization. In order to provide sustained growth and development – at least macroeconomic stability - in a market economy, one can claim that highly centralized and economically interventionist government structure should be transformed into one that encourages decentralized economic activities, whose functions are specified properly to complement markets.

*Decentralization*, which can be defined as the transfer of power and authority to local administrations, can improve the allocation of resources and make it more efficient by making the process of fiscal decisions closer to public preferences. In terms of allocation, the limited resources, available public goods, and the population preferences can be matched easier in a decentralized government than a centralized one. *Fiscal federalism* can be basically defined as the division of tax collection and expenditure assignments among different levels of the government. Decentralization and fiscal federalism both have political and economic aspects. Also, they have almost the same indications like the devolution of discretion from central to local levels and increasing importance of local levels in order to achieve an efficient allocation of resources.

Decentralization and fiscal federalism have recently gained importance. Political and fiscal decentralization is now under way in many countries and regions such as the

Central and Eastern Europe, China, former Soviet Union and Latin America. Economically, decentralization has become more important with the recognition that it is necessary to utilize public resources more efficiently now than in the past. Politically, it represents an attempt towards more privatization and liberalization.

There are two related but distinct theories about fiscal federalism and its economical benefits, *traditional and new federalism theories*. Allocative benefits of federalism are emphasized in traditional theories. Von Hayek (1945), who is one of the pioneers in this area, focused on the informational benefits of federalism. Because local governments have better access to local information, they can provide local goods and services more efficiently than the national government. Tiebout (1956) proposed a model of local finance that presents a chance to individuals to look for a community that is best suited to their tastes by providing a menu of outputs. This sorting mechanism, according to Tiebout, can be provided by inter-jurisdictional competition. Musgrave (1959) and Oates (1972) posited a theory of fiscal federalism stating that readjusting the tax and expenditure assignments between different levels of the government may result in improved welfare of the society. In order to improve the welfare and the policy responsiveness to the needs and demands, the transfer of more power and authority to elected local administrations is very important (Oates, 1972).

In this growing literature, we have recently faced with new theories. These new theories approach to the issue from a different perspective (such as Qian and Weingast, 1997). They have two new points of view. First is the question: Which circumstances foster the local government to maximize the local welfare? Second is approaching to fiscal issues in terms of the general relationships between government and economic agent by not assuming a benevolent government.

The basic implication of these new theories is that some types of federalism and decentralization can provide governments with better incentives to support market development and economic prosperity than others. Federalism, by devolution of authority from central to local levels, can prevent central government's interventionist behaviors. The first mechanism to foster local government's interest with economic prosperity is

that because of inter-jurisdictional competition, heavily interventionist local governments may lose valuable factors of production to less interventionist jurisdictions. Second, if the expenditures and revenues of local governments are strongly related to each other, then, the officials of the local government are required to support the local economy.

These theoretical approaches together with the empirical studies and research on different country cases have made this topic very popular. As people around the world are becoming more aware of the importance of influence and participation process in the decisions of their governments, all countries should respond to this demand sufficiently.

In this study, we try to shed light on local and central government relations in Turkey by inspecting the status of decentralization. Turkey has a strongly centralized government structure, which is inherited from Ottoman Empire and there is no specific or intended policy or program towards a more decentralized government structure as of today. In addition, there is no specific study about where Turkey stands in the framework of federalism and decentralization. However, as it is very important to know the present situation of Turkey in this framework, to formulate policies for the future and not to lag behind the general tendency toward decentralization in the world, this area should be studied carefully.

Based on the previous studies on budgetary systems of municipalities, which are main local government units in Turkey, we can say that local governments are highly dependent on the central government in terms of their fiscal structures. This can be observed easily, if we examine the juridical and fiscal procedures between municipalities and central government. Approval or prepermission of Ministry of Interior is needed for budgets, borrowings, pricing of services of municipalities and also for grants and transfers to municipalities. In addition to these fiscal inspections, Ministry of Interior has discretion on municipalities to demote the mayor and to appoint some bureaucrats directly. As a result of this lack of autonomy, the Ministry of Interior has recently changed approximately 75% of all the decisions of councils of municipalities (see Falay et al.). Moreover, taxes and tariffs cannot be adjusted against inflation and price and income movements such as property and environment cleaning tax rates are determined in every 5 years. Thus, own-revenues of municipalities in ratio of total revenues decreased to 20% after 1970 while it was 40 to 60% between 1925-1970.

Using a provincial data set, we empirically investigate firstly whether there is a tendency toward decentralization and secondly the expenditure and tax collection efficiency in Turkey. We first look at the bivariate relationships between relevant variables in order to constitute a general idea about their basic relationships. These guide us in our regression analysis. We then examine the multivariate relationships among our variables in the light of descriptive statistics. In the regression analysis, we expect to capture some of relationships that are either not very clear or not observed in the bivariate case. By examining the relationships of central and local expenditures and taxes with other budgetary efficiency variables, we get an idea about the present situation of Turkey vis a vis traditional theories. We are not able to apply the new theories to our case because we do not have sufficient data for the market structure and performance.

Our major findings reveal the following. While there is no significant trend towards expenditure decentralization in Turkey, we observe a slight trend towards tax decentralization. However, we also find that the lion's share of the total taxes collected in a province goes to the central government while municipalities cannot increase their tax revenues as GDP increases as much as the central government can.

As a result of our examination of the relationships between expenditure and agricultural production, we observe a noticeable policy of less tax collection and more expenditure in regions where agricultural production is dense, which can be interpreted as a kind of compensation policy of central government. This compensation policy of less tax collection and more expenditure is also observed in priority regions for development and emergency state regions.

We observe a positive correlation between private investment incentives given by central government and income level. When we look at the responsiveness of the central government to shocks realized in the macroeconomic environment, we do not see any significant compensatory policy of the national government against the volatility in GDP.

The social indicators are helpful variables in terms of the understanding of budgetary efficiency of governments. In this study, we use two social indicator variables, which are health measured by people per doctor and education measured by students per teacher. In case of health, our findings indicate that municipal and central spending are not enough in the provision of health services to individuals that belong to different



income groups. In case of education, again there is a slightly significant uneven distribution, though the local and central governments' education spending are more fair across provinces than in the case of health.

As we do not have an access to all the necessary data for time-series analysis, specifically constrained by local governments data, we were not able to conduct the detailed analysis that we wished to. Because of limited data, we perform a cross-sectional analysis by using the data from the last decade. Since we do not have time-series analysis, however, we have difficulty in interpreting some of the results and we cannot observe the time behavior in our major variables.

In chapter 2, the theory about fiscal federalism and decentralization and central and local government structures is described in more detail. Descriptive statistics focusing on the bivariate relationships between the variables is in chapter 3. The methodology and regression analysis are described in chapter 4. Chapter 5 is the conclusion.

## Chapter 2

### Theory and Background

The aim and the fundamental reason of the existence of government is the maximization of social welfare as individuals' aim is utility maximization, firms' aim is profit maximization and politicians' aim is vote maximization. Because, day by day, the market structure has grown and these markets need to have a regulatory power, the need for government has increased and it has become an inevitable phenomenon in the economic life. On the other hand, the uncontrolled growth of markets has made the distribution of income unfair. This causes the government to behave as a social regulator in the society. In our century, the social and economic role of government in the society and its functions and structure are debatable topics. The vertical structure of the public sector has important implications for the way in which government functions. It affects the kind of government services, how they are financed, the potential for innovation and even the overall size of government. We can summarize all these with some questions as the following: what is the need for government? What is the role of government in the economy? How should the functions be distributed among different levels of the government? How should the revenue and expenditure structures of them be? etc.

In section 2.1, the basic role of the government is presented. The allocation of functions among different levels of government is in section 2.2. Section 2.3 is about the

key elements of local administrations. We describe the theoretical perspectives on the benefits and costs of decentralization in section 2.4. Local government structure in Turkey is in section 2.5.

## 2.1 The Role of Government

Market failure is the basic reason for the need for government. Reaching an optimal allocation of resources rising from individual decision-making is a difficult process. Some classical and well-known assumptions should be made, such as informing people about the choices open to them, no monopoly power, no externalities, no public goods and perfect mobility of capital and labor.

Government intervention may also be necessary to secure the desired distribution of income. The Pareto criterion, being concerned only with economic efficiency, does not concern distributional issues. Since markets cannot produce the desired distributional outcome easily, governments have a key role in redistribution.

The most basic rationale for government intervention is the failure of market mechanism, there are other reasons like externalities and public goods provision. However, the government action does not guarantee a better situation. This depends on the capacity of government to respond sensitively to the needs and preferences of individuals and communities, and on its ability to obtain and process the necessary information. These possibilities limit the ability of governments to respond the market failure.

The possibility of improvement of failures with the help of the government intervention varies from case to case. An important element in the ability of governments to process information and to make appropriate decisions is the organizational structure of government. This is one of the main crucial things to think about in terms of decentralization.

The information processing of particular individuals or communities is healthier in decentralized governments. Politically and democratically more decentralized governments may also be more capable in reflecting the preferences of individuals. However, both of these advantages of decentralization must be weighted against the advantages of centralization in terms of administrative economies of scale, and against the need for central or national solutions to some of the problems of market failure.

Different policy targets bring different weights and determine the allocation of particular functions to central or local level. The proper degree of decentralization independent of the characteristics of the goods and services provided does not have a certain answer. Decentralization itself is neither good nor bad. The issue is whether it is successful or not (see World Bank, World Development Report, 2000). Successful decentralization improves the efficiency and responsiveness of the public sector while accommodating potentially explosive political forces. Unsuccessful decentralization threatens economic and political stability and disrupts the delivery of public services. The success of decentralization depends on its design.

## 2.2 Allocation of Functions among Levels of the Government

In order to understand decentralization of government and the rationale behind a decentralized government better, we should basically try to specify the functions of the different levels of the government. In the existing public-finance literature, a popular approach to this issue makes use of Musgrave's (1959) tripartite division of the public sector. Considering each of Musgrave's three functions of the public sector will be helpful to capture the idea of decentralization.

### *Macroeconomic Stability:*

The proper form and scope of macroeconomic policies to stabilize the economy at high levels of output and employment together with reasonable price stability is a very controversial topic of today as well as the past. In spite of this controversy, it can be claimed that the exercise of counter-cyclical policy must rest with the central government.

This claim has two aspects. First, the basic control over the money supply and credit is exercised by central government in nearly all countries. If each level of government has the right of creating and destroying money, there would exist a powerful incentive for local governments to finance their purchases of goods and services with local taxation. The aggregate result would obviously be a rapid national monetary expansion with concurrent inflationary pressures.

Second, regional or local economies tend to be highly open such that they import and export relatively large shares of the goods that they produce and consume. Such openness implies serious constraints on the capacity of decentralized governments to be responsible for counter-cyclical fiscal measures. If a local government, for example, were to undertake a substantial tax cut to stimulate the local economy, such an event happens that most of the newly generated spending would flow out of the local economy in payment for goods and services produced elsewhere with little ultimate effect on local levels of employment which is the main aim of the tax cut.

In brief, the absence of monetary rights and the openness of regional or local economies suggest that the potential for effective macroeconomic stabilization policy is quite limited at decentralized levels of the public sector. Thus, the central government having broad monetary and fiscal powers should have the primary role for an active counter-cyclical policy.

#### *Income Distribution:*

The other function of the public sector is the redistribution of income to achieve a socially just outcome. This typically implies a transfer of funds to low-income households to reach a somewhat more equal distribution of income. Again, local levels have some serious constraints to achieve this objective. First, when we think of in terms of perceiving poor relief and the well being of the poor elsewhere as a national goal, purely local policies cannot cover the income transfers throughout the nation that is the way should be pursued. Redistributive measures from this perspective are a “national public good” that requires a central-government presence.

Second, the capacity of decentralized governments to redistribute income can be limited by the potential mobility of households and firms. If a local government, for example, were to undertake program to redistribute income equally among poor and rich people, it would create compelling incentives for high-income people to move elsewhere and for low-income people to immigrate into the jurisdiction. Thus, such movements create a process that is not desirable from the perspective of most jurisdictions.

#### *The Provision of Public Goods and Services:*

Decentralized levels of government have their primary rationale in the provision of public goods and services. There are certain public goods, like national defense and

foreign policy, which benefit all members of a nation, that the central government is obviously the appropriate agent for providing such national public services. In contrast, the responsibility of many other public services belongs to local governments, including such things as refuse-collection system, local fire protection and many others. For such services, there is a compelling argument for decentralized provision. Centralized control tends to result in relatively uniform levels of services across local jurisdictions.

Decentralized provision of services, in contrast, provides the scope for adapting levels of output to the circumstances and tastes of individual jurisdictions. People suggesting the local control over these local goods and services say that the magnitude of the welfare losses from the uniform provision of public services can be quite sizeable and the levels of local services should be adjusted to the tastes of local constituencies.

## 2.3 Key Elements of Local Governments

Local accountability, fiscal autonomy and decentralization are the most important concepts in local government literature. How they are defined and measured, however, is debatable. The issues of local autonomy and local accountability are closely linked because the main reason for giving local government some fiscal jurisdictions is to encourage local accountability. Local accountability can enable promoting a more efficient allocation of resources and encouraging cost containment at the local level. This is the main rationale of decentralization.

*Local accountability* requires that the revenue to finance locally determined expenditures should be passed on to the local electorate either through taxation or user charges. This process becomes easy, if local governments have their own tax resources and are able to fix the tax rates by reference to the level of local services asked for by their local electorates. On this basis, it has been argued that there is a case for relatively large local taxes to finance, such as grants, over which the local government authorities may have little or no control. Thus, local government should be accountable to the local electorate.

*Local fiscal autonomy* depends upon the degree of discretion available to local government. Autonomy refers to revenues, grants or expenditures. Fiscal autonomy requires that local governments should be able to change the level and composition of its revenues. The revenue sources for local government are briefly following: own taxes,

overlapping taxes, non-tax revenues, shared taxes, general-purpose grants and specific grants. In practice, most of these instruments are subject to detailed controls by central government. For example, own taxes are almost always subject to constraints on the base and rates. In terms of autonomy, different kinds of grants offer different degrees of discretion to beneficiary governments. There are also different kinds of grants such as project specific grants, general-purpose grants and sector specific grants. The nature of the expenditure programs carried out by local governments is important in terms of local autonomy. Decision on the allocation of functions is the first way in which central government influences local autonomy over expenditure. Central government can constrain local autonomy by setting specific standards for each function that is carried out by local government. In education, for example, central government may determine the curricula, set ratio of teacher to pupil, teaching standards, etc. Here local government has no or little discretion and merely acts as an agent for carrying out centrally determined policies. Central government may leave local authorities entirely free as to whether or not they provide certain services and, if they do, the way in which the service is implemented.

*Fiscal decentralization* can be approached in three ways in the local level. The first is to decentralize the share of taxing and expenditure responsibility of lower levels of government. For example, in Denmark, local governments have substantial social welfare expenditure responsibilities as well as authority of taxing powers. It is hypothesized that local government shares of total taxes and expenditure is a good measure of the extent of this type of decentralization (Owen and Panella, 1991). The second approach is to decentralize expenditure responsibility but not the taxing authority, and to finance the gap with intergovernmental grants. Under this approach to decentralization, it could be expected to observe a higher sub-national government expenditure share, a smaller tax share, and a greater dependence on grants. The third approach is administrative or political decentralization of central government activities, i.e., giving more fiscal discretion to regional offices of various ministries or departments, involving local governments more directly in decisions regarding the allocation of central funds within region, etc. The third approach may not be quantified easily, but the statistical annex

provides information about the shares of different levels of government in overall revenue and expenditures.

Although we mention about the decentralization and fiscal federalism above in the framework of government structure and functions, a brief literature survey will also be given below.

## 2.4 Theories of Decentralization and Federalism: The Traditional and New Perspectives

Two different but related theoretical perspectives examine the economic effects of decentralization. Efficient allocation of scarce resources is the basic problem in this area. The traditional theories emphasize this point for informational reasons. There are two related ideas. The first one belongs to Hayek (1945) stating the crucial advantages of local decision-making process in terms of best using the local information. As the local conditions and the problems are known better by local governments than the national government and the transfer of information is problematic, local governments can have a better role in providing the local goods and services than the national government.

The second one is of Tiebout (1956). He presented a simple model, which yields a solution for the local level of expenditure for local goods that reflects the preferences of the individuals more adequately than can be reflected at the national level. His approach focuses on the inter-jurisdictional competition. According to Tiebout, this kind of competition among local governments on local expenditure allocation presents an opportunity to the residents to look for a community that is the most suitable one for themselves in terms of the provided local goods. In a centralized government structure where the provision of public goods is uniform, this kind of segregation mechanism cannot be achieved. Inman (1988), Buchanan and Brennan (1980) showed that inter-jurisdictional competition approach of Tiebout could limit local governments' behaviors. In the light of these ideas, Musgrave (1959) and Oates (1972) constituted a theoretical perspective of decentralization stating that there can be achieved an improvement in the welfare of society by making appropriate assignments of taxes and expenditures to the various levels of government.



Following a large literature in this area, there appear some new approaches to this issue that emphasize the ignored aspects of the benefits of decentralization (McKinnon, 1997; Weingast, 1997). Weingast and Qian in their paper (1997) ask the following question: how do governments commit to providing efficient local goods and preserving market incentives? They apply the theory of firm to address a range of problems in federal systems. The new theories do not accept the assumption of benevolent government with full commitment power. They mainly tackle the general regulation over economic activities or the state-market relations. Also they point out that very powerful and not controlled government intervention may be very harmful and malevolent to market preservation and regulation.

There are some important differences between new and traditional theories as the new theories concern with government incentives and state-market relations more than the traditional one. The main difference is in the transfers between central and local governments. The traditional theory, assuming benevolent government, claims that expenditure decentralization should be realized because of informational benefits of local levels. But it also considers the probability of the creation of bad allocation and the restricting of fiscal power of central government, which maintains the macroeconomic stability and equality among regions may be harmful for economic prosperity purposes. Because of these concerns, traditional theory says that the dependence of local governments to their own revenue collection to finance their expenditure is undesirable. Sizeable transfers from central to local governments are considered necessary to finance the expenditures of local governments.

The new federalism theories, in contrast, are more concerned with government incentives and focus on the importance of linking the financing local expenditures to the own revenues of local governments in order to attract the attention of them to local economic prosperity. According to new theories, the revenue distribution made in the spirit of traditional theories is harmful both to government's positive incentives and its financial discipline. The scenario also provides that the local governments' officials are responsible for their actions in the expenditures but in traditional theories, when the transfer revenue is the large portion of total revenue of local governments, the officials may perform the expenditures carelessly and inefficiently.

Strong fiscal incentives together with limited transfers from central government can foster local governments to realize the market reforms better. Zhuravskaya (1998), by using a simple model, examined the effects of the fiscal incentives for local governments on markets. First finding is that the strong fiscal incentives encourage local governments to put fewer restrictions on non-state enterprises. As more restrictions on enterprises reduce the revenue that is obtained by local governments, they increase their revenues by making restrictions flexible. Second, local governments facing with strong incentives try to make state-owned enterprises more productive and well performing. Third, because local governments obtain limited transfer, they make their expenditures and investments more carefully and they tend to provide more productive local goods and investments.

In China, which has realized an extensive reform, Weingast, Hehui and Qian (1999) showed that local governments are faced with strong fiscal incentives to pursue market reform. They find a strong correlation between local government's revenue collection and expenditures. They also find that the reform improves horizontal distribution across provinces in budgetary spending. As in the case of Russia, stronger fiscal incentives imply better economic performance, faster development of non-state enterprises and more reform in state-owned enterprises.

Dillenger and Webb (1999), in their paper concerning fiscal management in Colombia, observe a problematic case of decentralization trial. Because of the defective design of decentralization, Colombia has experienced some weakening of macroeconomic performance especially in the last decade. The decentralization has led to some problems, both in maintaining fiscal balance at the national level, as resources are transferred to sub national levels, and in preventing unsustainable deficits by the sub national governments. The problems have appeared because national government interference prevents departments from controlling their costs and because sub national governments have come to expect debt bailouts. Briefly, the fiscal problems of the national government in the 1990s mostly originated on the spending side for items not related to decentralization. The requirement to share all revenues with the sub national governments meant that the national government could not balance the budget just by raising taxes. The continued increase in transfers to the municipalities made the problems of the center worse.

This is a bad application of traditional fiscal federalism theory. Because it foresees expenditure decentralization but not revenue decentralization and it proposes to finance the local expenditures mostly with central transfers for the allocative and distributional purposes of the national government. However, in the case of Colombia, because of not determining all the arrangements and rules about the transfer system, this causes the creation of soft budget constraints for local governments, which means that they have come to expect debt bailouts by central government. In order to control sub national indebtedness, the national government of Colombia is currently working through both the borrowing-demand and the credit-supply channels (Webb and Dillenger, 1999).

## 2.5 Local Governments in Turkey

Decentralization issue is widely debatable in Turkey because the relationships between central and local governments appear mostly inefficient (see Falay, Kalaycıoğlu and Özkırmı, 1996). In contrast to most developing countries, Turkey currently does not have a specific program for a more decentralized government structure. When compared with the industrialized countries, Turkish government seems highly centralized. While sub-national levels of government are responsible for over 35 percent of total government expenditure in industrialized countries, in Turkey the underlying figure is about 10-11 percent. This percentage is between 12 and 15 on average in Latin American countries (Stein, 1997). Although, in the last decade, for example, decentralization tendency in Latin America is strong, in Turkey the percentage value decreased to 10.2 in 1998 from 11.7 in 1995.

In Turkey, municipalities are the main units in terms of representation of local government structure. Fiscal governance and budgetary process of municipalities became more apparent and important as a consequence of the increasing importance and problems of provinces. This increasing pattern enforced central government to take some financial, discretionary and legislative precautions. There was an attempt in 1984 to improve the political and economic structures of the municipalities, which is the enactment of the 'Statue concerning the administration of metropolitan municipalities' (Act No. 3030). However, by now, it has been realized that this act is not the proper remedy of the existing problems (Falay et al., 1996). There were also some attempts to improve the budgetary structure of local governments but again they could not solve the

problems completely. According to Falay et al. (1996), local governments are not strong enough in terms of possessing financial resources and generating new resources. Local governments' budget revenues are not enough because the shares that they take from central government's total tax revenue is not enough and they have no discretion of creating new income sources.

In terms of budgetary magnitude, Turkish local governments include villages, provincial offices and municipalities. Villages, provincial offices and municipalities cover financially 1%, 14% and 85%, respectively, of the total Turkish local governments' budget. Villages are local government units in which most of the services are provided by other local government units. On the other hand, municipalities are the main parts of the local governments.

According to a report by the State Planning Organization (2001), provincial offices, on average, gave 15% of the budgetary surplus between 1983 and 1998. While provincial offices were working with surplus, on the contrary, municipalities were in budgetary debt in all years and made an extra 6 % expenditure, on average, in addition to their budgets.

As of the end of 1995, the number of municipalities was 2802. This number increased year by year and it reached 3227 at the end of 1999. In Turkey, the urbanization rate is 66% and the ratio of people living in municipalities is realized as 81% in 2000. Similarly, 40% of the total population lives in metropolitan municipalities.

#### *Revenue side*

Local governments in Turkey have three main sources of revenue. The first one is the Shares Taken from Consolidated Budget Tax Revenue (STCBTR) for provincial offices and municipalities, the second is self-revenues and the third is borrowing. The allocation of the first part of the revenues is as follows:

- 6% to municipalities according to population,
- 1.14% to provincial offices,
- 3% to municipalities fund,
- 0.25% to local governance fund, (Local Governments Fund)
- 0.28% to provincial offices fund,
- 0.28% to local governance fund,

0.53% of revenues for local governance fund allocated as follows:

- 0.35% to local governance fund (Ministry of Interior Affairs),
- 0.18% to local governance fund (Ministry of Public Works and Housing),

Metropolitan municipalities also take 5% revenue from STCBTR. There are also other types of funds such as ministry of Culture fund, touristic municipalities fund and environment cleaning fund.

According to the budget structure (Appendix 2, table B), revenues can be separated into three parts: tax revenues, nontax revenues and borrowings. While revenues from STCBTR under tax revenues includes transfers from central governments, local taxes and nontax revenues constitutes the own revenues. Borrowings are financed from two sources: domestic borrowing and foreign borrowing. This part of the revenues has showed a continuously increasing pattern that it was approximately 8% of the total revenue in 1983 but it increased to 20% in 1998. The municipalities basically pay the second one back but these borrowings are guaranteed by the Treasury. These revenues are included in self-revenues. Municipality revenues significantly increased between 1983 and 1998. After 1980, revenue system of municipalities, which were basically financed by transfers from center and self-revenues, started to use borrowing as another source of financing. The ratio of borrowings in the whole budget was 8% in 1983 but it increased to 20% level in 1998.

The STCBTR constitutes on average, 45% of the total revenue of municipalities. This figure is 54% for metropolitan municipalities and 40% for other municipalities. The 45% percent of tax transfer from center is similar to that of the developed countries. If we think in terms of reaching to the national target of prosperity over the country and preventing the income distribution differences across the country, this ratio is normal. Thus, local governments should be compensated financially by central government according to their needs. Even if the transfer ratio from the center is at ideal level, which is assumed as the level of developed countries, the amount of total revenues of municipalities are not enough to balance the expenditures and they persistently incur debt in their budget because of this inadequate revenue sources.

There are basically two remedies of this problem and one of them may be applied in Turkey to solve this crucial problem. First, the tax transfer ratio from center should be

increased to a level that is sufficient for municipalities to balance their budget. Second, new revenue sources should be created for municipalities and the necessary financial and legislative regulations should be made (see also, Falay et al.).

#### *Expenditure Side*

According to budget structure, municipality expenditures can be separated into three: investment, transfer and current expenditures. Each category has an important sub-category: structure building; debt service and personal expenditures have priority in these expenditure breakdowns, respectively (Table C).

At the beginning of 1983, the ratios of investment, transfer and current expenditures were 25%, 13% and 62%, respectively. In 1998, however, it became as follows; 27%, 35% and 38%, respectively. For current expenditures, the ratio of personal expenditures was 44% in 1983 but it decreased to 25% in 1998.

## Chapter 3

### Descriptive Statistics and Data

Turkey has a highly centralized government that is inherited from the Ottoman Empire. We can also say that in our traditional system, it is very important to have a hierarchical structure among the discretions of different levels of the government. However, as the need for local goods provided by local governments increases, there has been an increase in importance of local governments, which are the main units of administrations responsible for local needs. In this study, we attempt to examine Turkey's recent situation in terms of this important process by looking at the local-central government relationships.

In our study, we compile a large provincial data set and produce descriptive statistics on the local and central governments of Turkey. There are currently 81 cities in Turkey with the addition of new ones. We try to reach all necessary data for our analysis. However, especially for new cities and for some variables, we do not have an access to all time-series data. In order to make the representation of this data easier, Appendix 1 provides the list of variables, abbreviations, data ranges, data sources and availability of data for each province. In the remainder of this chapter, we mainly examine basic relationships between these variables.

We first delineate the economic activities of local-central governments with the help of some descriptive statistics. To do that, we specifically look at the relationships between expenditures and revenues of both local and central governments with the level of per capita GDP, agricultural value added and income indicators such as the ratio of top %20 income to bottom %20 income (available for only 19 large cities). We also examine

the relationships of various breakdowns of government spending with the level of per capita income and its distribution. In addition, we look at the correlation between social indicators, which are education and health, and other budgetary variables. These relationships help us to understand the dimensions of the existing problems as well as to produce some hypotheses about them. These will guide us when we perform the regression analysis.

### 3.1 Central and Municipal Expenditures

We first examine the expenditures of the central government and local municipalities across the provinces. To do that, we look at the average of real per capita budget expenditures of both center  $\text{Avg}(\text{rEXPcpc})_i$  and municipalities  $\text{Avg}(\text{rEXPmpc})_i$ . We plot  $(\text{Avg}(\text{rEXPcpc})_i$  and  $\text{Avg}(\text{rEXPmpc})_i$ ) versus real per capita gross domestic product ( $\text{rGDPpci}$ ) (Figures 1.1-1.2). We observe that while  $\text{rGDPpci}$  is increasing, the average expenditure of center is slightly decreasing. This negative relationship is intuitive and reflects efficiency in the sense that it appears as government allocate more expenditure to provinces with lower  $\text{rGDPpc}$ . However, in the municipality expenditures case, we see a positive relationship, which either means that municipalities in higher income provinces spend more or that in provinces where municipalities spend more, income becomes higher. These results give some hints about the segregation of communities according to their income that is implicated by Tiebout model.

The expenditure side of decentralization is very important because unless local governments have autonomy over their expenditure, decentralization process cannot be realized properly. In this conjunction, we next plot real per capita expenditures of municipalities ( $\text{rEXPmpc}$ ) versus real per capita budget expenditure of the central government ( $\text{rEXPcpc}$ ) (Figure 1.3). We cannot see any relationship between them. In a country pursuing a decentralization process in terms of expenditure autonomy, we expect a negative relationship between central and municipal per capita expenditures (Webb, Dillenger, 1999). As we do not see a negative correlation in Turkey, we may say that Turkey's expenditure policy is not sufficiently in favor of decentralization.

In order to find the relationship between agricultural value added and expenditures, we plot them and we observe a slightly positive relationship between per capita local government expenditures and real per capita agricultural value added



(Avg(EXPmpc)<sub>i</sub> versus Avg(rVAagrpc)<sub>i</sub>) (Figures 1.4-1.5). In the case of per capita real expenditure of center versus per capita rVAagr, we do not see any relationship. The positive relationship in the case of municipalities means that in agricultural regions, the role of municipal budget expenditures is higher than others. We also look at the real per capita investment expenditure (rInvEXPpc) versus rVAagrpc and we come up with a slight negative relationship (Figure 1.6). This means that agricultural regions may be getting less investment spending than others.

We also look at the relationship between expenditures and the number of taxpayers (NuTAXp). In per capita expenditures, there is no relationship between rEXPpc and NuTAXp and there is a positive relationship between rEXPmpc and NuTAXp (Figures 1.7-1.8). If we think of the number of taxpayers as the magnitude of registered economy in a province, then we observe that when it increases, the municipality expenditures of that province also increase.

Income distribution is a very crucial concept in the context of budgetary efficiency. The relationships of our variables with the indicators of provincial level income distribution yield us significant hints about budgetary efficiency. There is a positive correlation between per capita income of top and bottom 20 % of households and per capita real budget expenditures of municipalities but there is no correlation for central expenditures (Figures 1.9-1.10 and Figures 1.11-1.12). Positive relationship may be interpreted in two different ways. First, when people become wealthier they receive more and this is not a good result for efficiency. On the other hand, when expenditure increases across provinces, wealth of people improves then this is an efficient result. Since our study does not involve time series analysis, we are unable to address these two directions of the reasoning.

Instead of income of top and bottom % 20 (Top20 and Bot20), we can use the ratio of Bot20 to rGDPpci (Avg(Bot20/GDPpc)<sub>i</sub>) and the ratio of Top20 to rGDPpc of Turkey (Avg(Top20i/GDPpc)) as variables for income distribution. For real per capita municipality expenditures, there is a negative relationship with Avg(Bot20i/GDPpci), but in Avg(Top20i/GDPpci) case, there is no relationship (Figures 1.13 and 1.14). For real per capita central expenditures, there is no correlation with Avg(Bot20i/GDPpci), but in Avg(Top20i/GDPpci) case, there is a slightly positive relationship which may be an

indication of inefficient budgetary expenditure pattern across provinces (Figure 1.15 and 1.16). However, due to small number of data points, we need to interpret the above results, which are based on income data of 19 provinces only, with caution.

## 3.2 Central and Local Tax Revenues

We secondly examine the characteristics of local and central tax revenue collection. The relationship between average of real per capita tax revenue for both central and local governments ( $rTAX_{cpci}$  and  $rTAX_{mpci}$ ) and  $rGDP_{pc}$  is positive (Figures 2.1-2.2). This is expected because when people have more income, they should pay more tax and this indicates the above result. We also observe that when the number of taxpayers increases, central and municipal real per capita tax revenues increase (Figures 2.3-2.4). This positive relationship is also valid for both government levels, if we use tax revenue per taxpayer instead of tax revenue (Figures 2.5-2.6). In addition to this, when we plot real per capita tax revenue of municipalities versus real per capita tax revenue of the center, we get a positive relationship between them (Figure 2.7). This result is expected because they are both increasing in income.

We next examine tax revenue relationship with income distribution indicators. Negative relationships are observed both between  $Bot20_{pci}/GDP_{pci}$  and  $rTAX_{cpci}$  and  $Bot20_{pci}/GDP_{pci}$  and  $rTAX_{mpci}$  (Figures 2.8-2.9). However, there is no relationship between  $rTAX_{mpci}$  and  $Top20_{pci}/GDP_{pc}$  (Figure 2.11). We see a slightly positive relationship between  $rTAX_{cpci}$  and  $Top20_{pci}/GDP_{pc}$  (Figure 2.10). We expect positive relationships between these variables because when people become richer, they should give more tax to both central and local governments. Our results are against expectations because while  $Bot20$  income is increasing, the amount of tax that they pay decrease. In addition, we do not see the strongly expected positive relationship in  $Top20$  income case. This shows that in Turkey, the wealth you have and the tax amount you pay are not correlated properly.

## 3.3 Measures of Decentralization

We define the ratios of expenditure of municipalities to expenditures of center ( $EXP_{pm}/EXP_{pc}$ ) and tax revenue of municipalities to central tax revenue ( $TAX_{pm}/TAX_{pc}$ ) as the measures of decentralization. When we look at the expenditures separately, we see

that  $rEXP_{pc}$  is negatively related with  $rGDP_{pc}$  and  $rEXP_{mpc}$  is positively related with  $rGDP_{pc}$  (Figures 1.1-1.2). Then, we observe that the expenditure ratio is positively related with  $rGDP_{pc}$  (Figure 3.1). This result is intuitive due to the observations made on the preceding sentences.  $rEXP_{mpc}$  is positively related with the number of taxpayers ( $NuTAX_p$ ) but  $rEXP_{pc}$  and  $NuTAX_p$  relationship is slightly negative (Figure 1.9-1.10). The ratio of expenditures is positively related with the number of taxpayers (Figure 3.2). This result is also intuitive as a result of individual relationships between expenditures and  $NuTAX_p$ . This is an indicator of municipalities being more responsive for the local needs and demands than the central government.

If we examine the tax revenue side, we see a negative relationship between  $TAX_m/TAX_c$  and both  $rGDP_{pc}$  and  $NuTAX_p$  (Figures 3.3-3.4). Tax revenue increases in both  $rGDP_{pc}$  and  $NuTAX_p$  and for both government levels (Figures 2.1-2.2-2.3-2.4). However, negative relationship in tax ratio tells us that tax revenue of municipalities increase in both  $rGDP_{pc}$  and  $NuTAX_p$  less than that of center. Thus, municipalities appears to have little ability or capacity of collecting taxes, or, generally, collecting own revenue. This is an important result about the efficiency of local governments while they are performing their budgetary practices. This result intuitively shows that decentralization had not been realized to a great extent in Turkey.

### 3.4 Volatility Measures

Another kind of variable that is important for fiscal policy and its efficiency is the volatility or variability of our variables. How central government has reacted to shocks occurring in the economy shows the responsiveness of the government to these shocks. Volatility in  $rGDP_{pc}$  ( $STDrGDP_{pc}$ ) and in  $rGDP_{pc}$  growth rate ( $STDrgrGDP_{pc}$ ) are our main variables with which we can observe the shocks or changes in economic environment. In our analysis, when we plot volatility in real per capita growth rate of central expenditures ( $STDrgrEXP_{pc}$ ) versus  $STDrgrGDP_{pc}$ , we do not see a relationship (Figure 4.1). The relationships of volatility variables with real tax revenue and real expenditures of central government are also ambiguous (Figures 4.2-4.3-4.4). Thus, we can say that the volatility in expenditures of central government is not associated with the volatility of the underlying macroeconomic environment.

### 3.5 Government Size

Government size is generally defined as total government expenditure in percentage of GDP in public finance literature. Similarly, we define a subset of total government expenditures, which is personal expenditure, as an indicator of government size. In our study, we try to investigate whether there is a correlation between real per capita personnel expenditure ( $rPersEXP_{pc}$ ) and real per capita tax revenue;  $rGDP_{pc}$ ; and the ratio of real tax revenue to number of taxpayers ( $rTAXc/NuTAXp$ ). We find a slightly positive correlation between  $rPersEXP_{pc}$  and  $rTAXc/NuTAXp$  (Figure 5.1). This result is intuitive in the sense that in provinces where the state's real per capita personnel spending is higher, tax collection appears more efficient. However, this causality may be interpreted also like that more tax revenue per tax payer may also result more employment opportunities. There does not appear to be any relationship between  $rPersEXP_{pc}$  and real per capita tax revenues of central and local governments (Figures 5.2-5.3). This says nothing about tax collection efficiency. However, we observe a negative correlation between  $rPersEXP_{pc}$  and  $rGDP_{pc}$  (Figure 5.4). Thus, it is possible to say that in the richer areas, the government size tend to be smaller than poorer ones.

### 3.6 Investment Spending

As a breakdown of spending, we examine the public investment expenditure and private sector investment incentives ( $PubInvExp$  and  $PrivInvInc$ ). The most important efficiency indicator under this topic is the number of employed people as a result of these investments ( $EMP_{pub}$  and  $EMP_{prvt}$ ). According to our data, the relationship between real aggregate private investment expenditures and the resulting number of employed people is positive as expected and this indicates efficiency in private investments incentives (Figure 6.1). However, in the case of public investment expenditures, there is no correlation (Figure 6.2). When we plot the same graph with per capita investments, we get the same results (Figures 6.3-6.4). We next try to connect both real per capita investment expenditures with  $rGDP_{pc}$ . In this case, we do not observe significant correlations between them except the positive relationship between  $rGDP_{pc}$  and  $rPrivInvInc_{pc}$  (Figures 6.5-6.6 and Figures 6.7-6.8). This positive relationship indicates that private incentives are higher in richer areas. We next check whether there is a

relationship between real per capita investment expenditures and Bot20pc and Top20pc. We get no significant relationships among them (Figures 6.9-6.10 and Figures 6.11-6.12). Thus, only the number of employed people as a result of private investment incentives appears significant for our analysis. Then, we may conclude that private sector investment incentives are more efficient than public investment expenditures.

### 3.7 Social Indicators

Lastly, we examine the connection between some crucial social indicators and our other budgetary variables. We have two different social indicators, which are the number of students per teacher (SPTeacher) and the number of people per doctor (PPDoctor). The education index does not vary much across provinces. However, a slight negative relationship with rGDPpc shows that people in richer areas have better education opportunities across the provinces (Figure 7.1). There is no significant correlation between education index and real per capita expenditures of central government (Figure 7.3). However, we have a slightly negative relationship education and municipal expenditures (Figure 7.2). For both of the income distribution variables, there is no correlation with Top20/Bot20 (Figure 7.4), Bot20pci/GDPpci (Figure 7.5) and Top20pci/GDPpc (Figure 7.6). There is a slight decrease in it, however, with the increase in Bot20pc (Figure 7.7) and Bot20pc/GDPpc (Figure 7.8) variables. These observations indicate that the government's education spending is rather even across the provinces of country.

With health indicator, on the other hand, we observe strong relationships. Firstly, it decreases with the increase of rGDPpc (Figure 7.9). When we plot PPDoctor versus rEXPmpc and rEXPpc, we observe negative relationships between them (Figures 7.10-7.11). PPDoctor is decreasing with almost all income distribution variables (Figures 7.12-7.13-7.14) except Bot20pci/GDPpci (Figure 7.15). As a result, the findings can be interpreted as people who are wealthier than others have better health opportunities across the provinces of the country. Thus, we may conclude that public spending on health may not be accommodative of all income groups in an even way.

## Chapter 4

# Methodology and Regression Analysis

### 4.1 Methodology

In this chapter, we empirically analyze the determinants of variables related to budgetary efficiency in Turkish provinces. In order to do this, we regress these budgetary variables on some other explanatory variables. Our basic variables are municipal and central expenditure, tax revenues, GDP, education and health indicators. However, by using these basic variables, we obtain different set of variables, such as expenditure and tax ratios, volatility in GDP and in central expenditure. Thus, we have about 20 variables together with the mentioned ones generated from the basic variables. Table 4 in Appendix 2 includes all data that we use in regression analysis.

Initially, we intended to do a panel data analysis but due to the difficulties in obtaining some of the data for the last decade, we use only a cross-sectional analysis in the current study. As we have time-series data for some of the variables, we used yearly average of these data in the regression analysis<sup>1</sup>.

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<sup>1</sup> for example, we have real per capita central expenditure data of each province for 10 years but in our data set, we take the average of these 10 years data and then use it.

In order to be able to interpret the results, we use real and per capita values for our data. In addition to this, in order to avoid the scale problems in our regression analysis, all variables are converted into logarithmic scale except those appearing in ratios such as decentralization measures and income ratios of top and bottom. In our regression analysis, we also use two different dummies, which are OHAL (Emergency State Regions) and KOY (Priority Regions for development), as control variables. Moreover, all regressions are white-heteroscedasticity consistent and robust.

An important note is that income distribution variables are available only for 19 of the 81 provinces in our regressions. Hence, this obviously poses a problem of the loss of degrees of freedom. Table 1.b and 2.b in Appendix 2 present the results of our regressions conducted by adding the income distribution variables to the variables in Table 1.a and 2.a. Because of lack of degrees of freedom, the results obtained from these regressions are not comparable with the ones obtained without using income distribution variables. Also, we observe that different data sources give different data for the same variables and for the same years<sup>1</sup>. In addition, there appear measurement problems with some data<sup>2</sup>.

## 4.2 Regression Analysis

### 4.2.1 Central and Municipal Expenditures

In order to understand the multivariate relationships among central and municipal expenditures and other variables, we make regression analysis. These regressions are reported in the first three columns of Table 1.a and 1.b. When we regress central expenditure on rGDPpc, Vaagr, Taxc and income distribution variable, we observe significant results. The relationship between Expc and rGDPpc is negative and significant as observed in the graphical analysis. This result indicates expenditure efficiency in the sense that central government expenditure is high in lower GDP regions. However, the causality may also be vice versa.

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<sup>1</sup> for example, State Planning Organization and General Directorate of Public Accounts give different values for investment expenditures. We use the first ones' data because it gives the breakdowns of the investment expenditures as public and private.

<sup>2</sup> for example, agricultural production is higher than total production in Ağrı, Muş, Ardahan.

Positive correlation between agricultural production and central expenditure may be interpreted as there is expenditure compensation to the regions whose agricultural production is high. In addition, the dependence of central expenditures to central tax collection can be recognized easily. In the regression of central expenditures on municipal expenditures, the relationship between these two variables is significant and positive. We also observe similar relationship in the graphical analysis. In countries, which are decentralized in terms of expenditure, this relation is negative but in Turkey, we do not see any negative relationship. In addition, we used two different dummy variables which are OHAL (D1, Emergency State Regions) and KOY (D2, Priority Regions for Development). In central expenditure case, OHAL's and KOY's coefficients are positive and significant indicating more expenditure for OHAL and KOY as expected (Table 1.a).

We then regress EXPm on rGDPpc, Vaagr, Taxm and the D1 and D2. We find positive but not significant relationship between EXPm and rGDPpc as in the graphical analysis. The coefficient of VAagr is positive and significant, which implies that when agricultural production increase, then municipal expenditure also increase and this also can be interpreted as an expenditure compensation policy of municipalities to agricultural regions. The correlation of EXPm with TAXm is significant and positive. D1 has a positive but not a significant coefficient. D2 has a negative but not significant coefficient in the EXPm regression analysis. This shows that central government make more expenditure for OHAL and KOY than municipalities do.

When we add the income distribution variable, Top20/Bot20, to our analysis, we see positive correlation for both central and municipal expenditures (Table 1.b). However, income distribution variable is not significant in both cases. Moreover, the goodness of fit remarkably decreases in the central expenditure case with the addition of income distribution variable. The positive relationship can be interpreted as when income distribution becomes worse, municipality expenditure increases.

Although we would have liked to make an analysis of whether local governments are self-financing or not, we cannot find the necessary own revenue data of municipalities. This analysis would have also provided useful information about decentralization.



## 4.2.2. Central and Municipal Tax Revenues

We next look at the real per capita tax revenues of central and municipal governments (fourth and fifth columns of Table 1.a and 2.a). The coefficients of  $rGDPpc$  in our regression analysis are both positive, as expected, and significant as in the graphs. The correlation between central tax revenue and municipal tax revenue is negative and significant. We find this relationship positive in graphical analysis and we say that this positive relation is expected because of increasing of both of them with income. The negative relationship in our regression can be interpreted in terms of decentralization that there is a transfer of some discretions of tax revenue collection between different levels of the government. But, we do not know the direction of this discretion transfer. However, we did not see any expenditure side decentralization in the expenditure analysis in previous section. We observe negative and significant relationships of both  $TAXc$  and  $TAXm$  with  $VAagr$ . This may be interpreted as a kind of ‘incentive’ for agricultural regions by collecting lesser tax. The significant dependence of tax collection and expenditure is also observed in these regressions. We get negative and significant coefficients for central tax collection but not for municipal tax collection for dummy variables. This indicates that, central government makes less tax collection from OHAL and KOY than municipalities, which can be understood as a compensation for these provinces.

When we add income distribution variable,  $TOP20/BOT20$ , to our analysis, we observe that it does not have a significant effect on both tax revenues. It is positive but not significant. Thus, we can say that income distribution is not an effective variable for tax collection.

## 4.2.3 Measures of Decentralization

We analyze the expenditure ratio,  $EXPm/EXPc$  as one of the decentralization measures. Except  $rGDPpc$ , other variables are almost not related with expenditure and tax ratios significantly. We see a positive correlation of expenditure ratio with  $rGDPpc$  as in the graphical analysis. When we look at the relationships between  $rGDPpc$  and expenditure variables separately, we see positive correlation with municipality and

negative correlation with central expenditures. Then, we can say that the positive correlation in expenditure ratio case is expected from these individual relationships.

Similarly, the separate relationships of rGDPpc with central and municipal tax revenue variables are positive. On the other hand, the tax ratio,  $TAX_m/TAX_c$ , and rGDPpc are negatively and significantly correlated with each other as in the graphical analysis. Then, we can say that this negative relationship indicates that the municipality tax collection increase in GDP less than that of center. Thus, as indicated in graphical analysis, this relationship says that revenue decentralization had not been realized to a great extent in Turkey.

#### 4.2.4 Volatility Measures

We next examine the volatility variables that are important for the fiscal policy (Table 3). These variables help us to understand central governments' response to the shocks in the macroeconomic environment. We further explore this issue, which does not appear in the graphical analysis. Firstly, we regress volatility in rGDPpc (VOLGDP) on VAagr; volatility in central expenditure (VOLExpc); our decentralization measures and dummies. Only VAagr and VOLExpc are significantly related with VOLGDP and their coefficients are negative. We rather expected to get a positive relationship between volatilities of GDP and central expenditure in terms of a way of thinking that when the volatility in GDP increases (or decreases), government, as a policy maker, adjust these movements in GDP by using the expenditure instrument properly. Expenditure ratio is positively and tax ratio is negatively related to VOLGDP but both are insignificant. The dummy variables' coefficients are positive but not significant.

Secondly, when we regress volatility in central expenditure on VAagr and dummies, we recognize a negative and significant correlation between VAagr and VOLEXPC. We cannot say a certain thing about this relationship because we do not have time series data of VAagr and so the volatility in VAagr. The D2 is negatively and significantly related with expenditure volatility. This result may be interpreted such that the amount of expenditure for priority regions does not change drastically over time.

## 4.2.5 Investment Spending

When we analyze the public investment expenditures and private investment incentives, we observe a significant relationship only between PrivInvInc and rGDPpc as in our graphical analysis (Table 2.a). This correlation is positive and indicates that private incentives are higher in richer areas. However, when we add income distribution variables, namely TOP20pc/rGDPpc and BOT20pc/rGDPpci, a reverse relationship is observed, which is negative and insignificant, and BOT20pci/rGDPpci is negatively and significantly related with PrivInvInc (Table 2.b). In addition, we look at the relationships of GDP growth (GrGDP) with PrivInvInc, PubInvExp, EXPc, EXPm and dummies. The only significant correlation is in between PrivInvInc and GrGDP, positively. We also see this positive relationship in between GDP level and PrivInvInc (Table 3).

In PubInvInc case, we do not observe any significant correlation (Table 2.a). However, when we add income distribution variables to our analysis, we observe that GDP is positively and significantly and TOP20pci/rGDPpc is negatively and significantly related to public investment expenditure (Table 2.b).

## 4.2.6 Social Indicators

In the regression analysis of social indicators, we almost see the same relationships that we observe in the graphical analysis, but more strongly. First we regress our education indicator, student per teacher (SPTeacher), on rGDPpc and central and municipal expenditures. All of them are negatively related with SPTeacher but only the coefficient of rGDPpc is significant (Table 2.a). The negative relationships in expenditure cases can be interpreted as good indicators of efficiency but they are insignificant. But this relationship can also be interpreted such that expenditures should increase where SPTeacher is high and so this result is indicator of inefficiency. These results do not appear in the graphical analysis. We use also our two dummy variables in this regression. Only D1 is positive and significant for education indicator case and the positive correlation is expected. When we add income distribution variable, BOT20pc/rGDPpci, it does not appear as significant variable and also the significant correlation of GDP with SPTeacher disappears (Table 2.b).

We see negative and significant relationships of our health indicator, people per doctor (PPDoctor), with rGDPpc, central expenditure, municipal expenditure and dummy variables (Table 2.a). Except the dummy variables whose coefficients are positive, the other variables have negative and significant relationships with PPDoctor. We observe these negative relationships also in the graphical analysis. Increasing of health quality when expenditures increase is an expected result and is a good result in terms of expenditure efficiency. However, this relationship can be interpreted as a bad result as in the case of education. The positive relationship of D1 and D2 are expected. After adding the income distribution variable, it appears as negative and significant, which we also expect (Table 2.b).

## Chapter 5

### Results and Conclusion

Globalization process is under way all over the world. Therefore, the importance of the role of local governments, which meet the local needs, is also increasing day by day. There is a general and strong tendency towards decentralization and federalism, the devolution of authority from central to local levels, in the world. There is limited but growing literature about fiscal federalism and decentralization. Besides the traditional theories, the new federalism theories bring contemporary perspectives to these controversial issues.

The number of empirical and case studies about decentralization has been growing as many countries try to apply these theoretical approaches to their government structures. There are not only successful countries like China, but also problematic ones like Russia and Colombia due to the defective design of decentralization.

In this growing empirical literature, there is no specific study reflecting Turkey's recent situation in terms of decentralization. As it is very important to know where Turkey stands in this framework, to find remedies for existing problems about government structure and to follow the global tendency toward decentralization in the world properly, fiscal federalism and decentralization should be studied carefully.

In this study, we examine expenditure and tax collection efficiency and recent situation of Turkey in decentralization process by looking at the local-central government fiscal relationships. We studied a provincial level data set in order to empirically investigate the basic implications of the traditional theories. We address budgetary efficiency by examining the bivariate and multivariate relationships among relevant variables.

The initial focus of the study is on whether there is an attempt to more decentralized government structure in Turkey. We observe that there has not been a significant trend toward expenditure decentralization recently. However, we observe a slight trend toward tax decentralization that is devolution of discretion from central to local governments in terms of tax collection. But we also recognize that the great portion of the total taxes collected in a province goes to central government, while municipalities do not have as much ability to improve their tax revenues as GDP increases as the central government does.

Besides the fact that Turkey does not have a specific program for expenditure decentralization, it has even decreased the ratio of local spending out of total government spending between 1995 and 1998. While this ratio is approximately 35% in industrialized countries and 12-15% in Latin American countries, the underlying figure is about 11% in Turkey. According to the Stand-by treaty of Turkey with IMF in year 1999, before it collapsed, it had foreseen that own-revenues of local governments should be increased and there should be no grant or transfer except for the existing tax transfers. However, since it ended, it is unknown what the future of this intention will be.

The revenue decentralization is important as much as expenditure decentralization as indicated by new federalism theories. The tax revenue is the most important part of the revenues for all levels of governments. Turkey has big problems with tax collection. The basic problem is the difference between planned and realized amount of collected tax. Governments cannot sufficiently succeed in collecting tax. The remedy of this is not increasing tax rates or bases which Turkey try to do. The remedy should be increasing the realized amount of tax collection with the existing tax rates and bases. An interesting and striking example that shows the recent situation of Turkey in tax collection is that according to a research done by Ministry of Finance, only 37 out of 3100 tax written

statements of taxpayers given to the inspectors of Ministry is legal in 2000. The others are not legal and include some deficiencies.

Giving municipalities the discretion to collect all taxes in their own regions while some part of this collected tax is transferred directly to the municipalities may prevent this kind of inefficiency. This not only increases the efficiency of tax collection, which increases the realized amount of tax collection, but also creates an incentive mechanism for municipalities to increase their own revenues. This method is applied in metropolitan municipalities and widening it across all municipalities may be useful. This method, of course, makes municipalities with high GDP more advantageous with respect to the ones that have lower GDP. This can be prevented by adjusting the amount of tax, which is transferred to local governments from the central government not only according to the population size, but also according to the municipalities' GDP level.

The next major concern of the analysis is the effects of the shocks realized in the macroeconomic environment, which is GDP volatility, on the government's actions. We do not see any significant compensatory policy of the central government against these shocks. Another result is that private investment incentives given by central government to private enterprises are higher in richer areas.

Another striking finding is that central expenditures have a compensative role in the agricultural regions that they increase when agricultural production increase in a province. Similarly, tax collection lessens in the regions where agricultural production is dense that can be interpreted as an incentive policy of central government. In addition, central government applies these policies in priority regions for development and emergency state regions.

Another point worth mentioning about the results of our inquiry is about the social indicators, which are important for understanding budgetary efficiency of governments. In case of health, we observe a significant uneven distribution of the facilities and inequality among different income groups, which can be prevented by central and municipal governments by pursuing proper expenditure policies. In case of education, however, if it is compared with the health case, we see that spending makes education facilities fairer across provinces than in the case of health.

Developments with regards to fiscal federalism and decentralization in Turkey, where Turkey stands in political decentralization framework and what the current situation of Turkey is in terms of new fiscal federalism theories are striking and interesting topics for further research.



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# **APPENDICES**

## **APPENDIX 1: Data Source and Descriptions**

We should point out that our study contains several kinds of data provided from different sources. We also have a lot of produced data such as per capita values, standard deviations of some variables, growth rates, average values and so on. As we have a huge data set, we should use some abbreviations. This is important to make life easier. The following table contains variables, abbreviations, sources and time range for data set. Number in the provinces column represents the number of provinces whose data is available for the underlying variable.

<b>VARIABLE</b>	<b>ABBREVIATION</b>	<b>SOURCE</b>	<b>DATA RANGE</b>	<b>PROVINCES</b>
<b>GROSS DOMESTIC PRODUCT</b>	GDP	STATE STATISTICAL INSTITUTE (DIE)	1990-1997	79
<b>CENTRAL GOVERNMENT TAX REVENUE</b>	TAX <sub>c</sub>	GENERAL DIRECTORATE OF PUBLIC ACCOUNTS (MUHASEBAT MUDURLUGU) (MM)	1990-2000	79
<b>CONSOLIDATED BUDGET REVENUE OF CENTRAL GOVERNMENT</b>	REV <sub>c</sub>	MM	1990-2000	79
<b>CONSOLIDATED BUDGET EXPENDITURE OF CENTRAL GOVERNMENT</b>	EXP <sub>c</sub>	MM	1990-2000	79
<b>CONSOLIDATED BUDGET EXP. OF CENTRAL GOV FOR PERSONNEL</b>	PersEXP <sub>c</sub>	MM	1990-2000	79

<b>CONSOLIDATED BUDGET EXPENDITURE OF CENTRAL GOVERNMENT FOR INVESTMENT</b>	InvEXPc	MM	1990-2000	79
<b>CONSOLIDATED BUDGET EXPENDITURE OF CENTRAL GOVERNMENT FOR TRANSFER</b>	TRc	MM	1990-2000	79
<b>MUNICIPAL TAX REVENUE</b>	TAXm	DIE	1995 & 1998	76
			1998	3
<b>CONSOLIDATED BUDGET EXPENDITURE OF MUNICIPALITIES</b>	EXPm	DIE	1995 & 1998	76
			1998	3
<b>PUBLIC INVESTMENT EXPENDITURE</b>	PubInvExp	STATE PLANNING ORGANISATION (DPT)	1990-1997	79
<b>EMPLOYED NUMBER OF PEOPLE AS A RESULT OF PubInvExp</b>	EMPpub	DPT	1993	65
<b>PRIVATE SECTOR INVESTMENT INCENTIVES</b>	PrivInvInc	DPT	1992-1997	79

<b>EMPLOYED NUMBER OF PEOPLE AS A RESULT OF PrivInvInc</b>	EMPprvt	DPT	1992-1997	80
<b>TOTAL AGRICULTURAL PRODUCTION</b>	VAagr	DPT	1996	79
<b>NUMBER OF TAXPAYERS</b>	NuTAXp	DPT	1997	80
<b>TOTAL NUMBER OF HOUSEHOLDS</b>	#HouseH	DIE	1994	19
<b>TOTAL REVENUE OF TOP % 20 HOUSEHOLDS</b>	Top20	DIE	1994	19
<b>TOTAL REVENUE OF BOTTOM % 20 HOUSEHOLDS</b>	Bot20	DIE	1994	19
<b>RATIO OF NUMBER OF STUDENTS TO NUMBER OF TEACHERS</b>	SPTeacher	DPT	1996	79
<b>NUMBER OF PEOPLE PER DOCTOR</b>	PPDoctor	DPT	1996	80



For per capita values of variables, we put ‘pc’ following a variable such as GDPpc, Top20pc. ‘m’ stands for municipality and ‘c’ stands for center. We used ‘Avg’ in front of the variables that are shown in averages, such as Avg(EXPc/GDP), which means the average of consolidated budget expenditure of central government in ratio to GDP. For the standard deviation of a variable, we put ‘STD’ in front of it such as STDrGDP. If the variable is in constant price, we use ‘r’, which stands for ‘real’ in front of it, such as rGDP. For growth rate of a variable, we put ‘gr’ in front of it, such as grrGDPpc, which means the growth rate of real GDP per capita. The suffix ‘i’ represents that data belongs to province ‘i’, such as (Bot20pc/GDPpc) i represents the per capita revenue of bottom 20 percent of the households in a specific province, in ratio to per capita GDP in that province. The expressions D1 and D2 mentioned in the regression analysis stands for OHAL (Emergency State Regions) and KOY (Priority Regions for Development), respectively.

## **APPENDIX 2: Tables**

# CORRELATION MATRIX

	EXPRATIO	TAXRATIO	RGDPPC	RTAXCPC	RTAXMPC	REXPCPC	REXPMP	RPUBINVEXPPC	RPRIVINVEXPPC	RVAAGRPC	BOT20PC	TOP20PC	BOT20PERGDPPCI	TOP20PERGDPPC	TOP20PERBOT20	PPDOCTOR	SPTEACHER	RGRGDPPC	NUTAXP	RPERSEXPPC
EXPRATIO	1																			
TAXRATIO	-0,5	1																		
RGDPPC	0,746	-0,8	1																	
RTAXCPC	0,678	-0,83	0,906	1																
RTAXMPC	0,638	-0,63	0,819	0,913	1															
REXPCPC	-0,44	0,044	-0	0,176	0,234	1														
REXPMP	0,685	-0,61	0,852	0,916	0,966	0,251	1													
RPUBINVEXPPC	0,183	-0,39	0,504	0,54	0,369	0,367	0,488	1												
RPRIVINVEXPPC	0,523	-0,5	0,6	0,425	0,399	-0,35	0,397	0,194	1											
RVAAGRPC	-0,24	0,322	-0,3	-0,49	-0,53	-0,09	-0,42	-0,15	-0,16	1										
BOT20PC	0,144	-0,55	0,553	0,543	0,679	0,329	0,563	0,147	0,435	-0,43	1									
TOP20PC	0,149	-0,5	0,476	0,511	0,662	0,362	0,536	-0	0,308	-0,41	0,953	1								
BOT20PERGDPPC	-0,7	0,59	-0,84	-0,67	-0,66	0,198	-0,7	-0,39	-0,72	0,09	-0,38	-0,27	1							
TOP20PERGDPPC	0,061	-0,34	0,143	0,35	0,346	0,33	0,289	-0,13	-0,27	-0,37	0,368	0,582	0,208	1						
TOP20PERBOT20	0,072	2E-04	-0,09	0,066	0,145	0,2	0,092	-0,43	-0,29	-0,08	0,124	0,415	0,239	0,833	1					
PPDOCTOR	0,12	0,469	-0,37	-0,49	-0,52	-0,7	-0,48	-0,26	0,01	0,335	-0,73	-0,76	0,041	-0,62	-0,3	1				
SPTEACHER	0,057	0,29	-0,2	-0,12	0,024	-0,15	-0,08	-0,24	0,042	-0,48	-0,06	-0,03	-0,01	-0,13	0,047	0,367	1			
RGRGDPPC	0,687	-0,73	0,773	0,638	0,572	-0,33	0,579	0,165	0,728	-0,27	0,491	0,465	-0,7	0,232	0,092	-0,22	-0,15	1		
NUTAXP	0,473	-0,53	0,648	0,646	0,797	0,081	0,732	0,073	0,291	-0,55	0,786	0,761	-0,44	0,435	0,159	-0,6	-0,04	0,561	1	
RPERSEXPPC	-0,46	0,16	-0,09	0,038	0,026	0,904	0,073	0,392	-0,39	0,134	0,056	0,109	0,201	0,17	0,182	-0,46	-0,17	-0,38	-0,25	1

**Table B: Municipality Revenues, as percentage.**

	<b>1983</b>	<b>1985</b>	<b>1987</b>	<b>1989</b>	<b>1991</b>	<b>1993</b>	<b>1995</b>	<b>1998</b>
<b>Tax Revenue</b>	53,6	60,7	58,3	69	67,5	50,6	55,8	54,9
Central Tax	40,4	51	45,3	56,7	57,3	44,2	44,9	44,1
Local Taxes	13,2	9,9	13,1	12,3	10,2	6,4	10,9	10,8
<b>Nontax Revenue</b>	38,4	32,2	24,5	15,7	16,8	22,8	28,5	25,4
<b>Borrowings</b>	7,9	7,1	17,2	15,3	15,7	26,7	15,8	19,7
In	7,9	5,5	13	7,8	7,9	12,6	11,1	12,5
Out	0	1,6	4,2	7,5	7,8	14,1	4,6	7,1
<b>Total</b>	100	100	100	100	100	100	100	100

Source: DPT

**Table C: Municipality Expenditures, as percentage.**

	<b>1983</b>	<b>1985</b>	<b>1987</b>	<b>1989</b>	<b>1991</b>	<b>1993</b>	<b>1995</b>	<b>1998</b>
<b>Current Expenditures</b>	62	52,3	39	49,3	51,4	48,8	38,2	38
Personal	44,1	33	22,3	31,2	38,6	38,6	26,7	25,3
<b>Investment Expenditures</b>	25	30,9	41,2	18,9	15,5	22,7	20,1	27,2
<b>Transfers</b>	13	16,8	19,8	31,8	33,1	28,5	41,7	34,8
Borrowings	6,2	5,4	6,5	17	22	13,4	24,6	19,6
In	6,2	5,2	6	14,9	15,9	7,7	14,8	8
Base	5,6	5	5,7	13,7	13,6	4,9	9,5	5,3
Interest	0,6	0,2	0,3	1,2	2,3	2,8	5,3	2,7
Out	0	0,2	0,5	2,2	6,2	5,7	9,9	11,6
Base	0	0,2	0,4	1,5	4,8	3,9	6,3	9,6
Interest	0	0	0,1	0,7	1,4	1,8	3,6	2
<b>Total</b>	100	100	100	100	100	100	100	100

Source: DPT

TABLE 1.a

Dependent Variables ---->	~~Decentralization Measures~~						
	EXPc		EXPm	TAXc	TAXm	EXPm/EXPc	TAXm/TAXc
	( I )	( II )					
<b>GDP</b>	-0,37 [-4.11]***	-	0,02 [0.49]	0,75 [8.38]***	0,12 [2.1]**	0,21 [3.19]***	-0,22 [-1.7]*
<b>VAagr</b>	0,16 [2.78]***	-	0,07 [2.61]**	-0,46 [-5.34]***	-0,13 [-4.59]***	-0,11 [-2.1]**	0,1 [1.48]
<b>EXPm</b>	-	0,3 [3.13]***	-	0,92 [2.19]**	0,89 [14.1]***	-	-
<b>EXPc</b>	-	-	-	0,56 [5.22]***	0,05 [1.08]	-	-
<b>TAXc</b>	0,47 [4.6]***	-	-	-	-0,08 [-1.85]*	-	-
<b>TAXm</b>	-	-	0,98 [16.7]***	-0,67 [-1.81]*	-	-	-
<b>D1</b>	0,29 [5.85]***	0,3 [4.62]***	0,01 [0.62]	-0,18 [-1.9]*	-0,02 [-0.72]	-0,07 [-3.63]***	0,01 [0.12]
<b>D2</b>	0,11 [2.47]**	0,07 [1.74]**	-0,03 [-1.64]	-0,17 [-4.01]***	0,004 [0.25]	-0,07 [-2.85]***	0,15 [2.54]**
<b>Constant</b>	4,43 [6.89]***	4,23 [8.43]***	-0,2 [-0.57]	-0,82 [-0.92]	0,6 [1.71]*	-0,27 [-0.63]	0,91 [0.86]
<b>Ad. R<sup>2</sup></b>	0,42	0,28	0,93	0,84	0,93	0,44	0,28
<b>Number of Obs.</b>	79	78	78	78	78	79	79

1) \*, \*\*, \*\*\* represent % 10, % 5 and % 1 significance levels, respectively.

2) All variables are real and in per capita terms. They are all in log terms except decentralization measures and dummy variables.

3) t-statistics are given in brackets.

4) Variable descriptions can be found in the Appendix1.

TABLE 1.b

Dependent Variables --->	~~Decentralization Measures~~						
	EXPc		EXPm	TAXc	TAXm	EXPm/EXPc	TAXm/TAXc
	( I )	( II )					
<b>GDP</b>	-1,29 [-1.5]	-	0,27 [2.66]**	1,24 [3.18]**	-0,12 [-0.78]	0,83 [3.22]***	-0,53 [-4.59]***
<b>VAagr</b>	0,15 [1.37]	-	0,1 [1.99]**	-0,19 [-1.74]	-0,12 [-2.99]**	0,02 [0.24]	0,05 [1.33]
<b>EXPm</b>	-	0,27 [1.13]	-	0,86 [1.27]	0,88 [3.77]***	-	-
<b>EXPc</b>	-	-	-	0,25 [1.49]	0,005 [0.05]	-	-
<b>TAXc</b>	0,66 [1.56]	-	-	-	-0,002 [-0.01]	-	-
<b>TAXm</b>	-	-	0,97 [6.87]***	-0,01 [-0.01]	-	-	-
<b>TOP20/BOT20</b>	0,11 [0.19]	0,45 [0.86]	0,04 [0.27]	0,05 [0.22]	0,03 [0.21]	0,36 [0.98]	0,06 [0.3]
<b>D1</b>	0,37 [1.82]	0,14 [0.66]	0,05 [2.98]**	-0,44 [-4.09]***	-0,04 [-0.61]	-0,04 [-0.84]	0,36 [5.74]***
<b>D2</b>	-0,05 [-0.29]	0,06 [0.48]	0,07 [2.28]**	0,09 [0.67]	-0,07 [-1.72]	0,06 [0.66]	0,02 [0.2]
<b>Constant</b>	9,02 [2.79]**	4,1 [3.14]***	-1,9 [-2.62]**	-6,69 [-3.27]***	1,81 [1.66]	-5,25 [-2.43]**	3,12 [3.62]***
<b>Ad. R<sup>2</sup></b>	0,06	-0,08	0,96	0,93	0,96	0,42	0,83
<b>Number of Obs.</b>	19	18	18	18	18	19	19

1) \*, \*\*, \*\*\* represent % 10, % 5 and % 1 significance levels, respectively.

2) All variables are real and in per capita terms. They are all in log terms except decentralization measures, dummy variables and income distribution variable.

3) t-statistics are given in brackets.

4) Variable descriptions can be found in the Appendix1.

TABLE 2.a

Dependent Variables ---->	~~~Social Indicators~~~				
	PubInvExp	PrivInvInc	GDP	PPDoctor	SPTeacher
<b>GDP</b>	0,31 [1.26]	1,37 [6.3]***	-	-0,24 [-4.19]***	-0,11 [-2.19]**
<b>VAagr</b>	0,06 [0.41]	-0,04 [-0.25]	-	-	-
<b>EXPm</b>	-	-	0,57 [6.41]***	-0,22 [-2.2]**	-0,04 [-0.44]
<b>EXPc</b>	-	-	-0,06 [-0.5]	-0,72 [-11.57]***	-0,08 [-1.60]
<b>PubInvExp</b>	-	-	-0,03 [-0.46]	-	-
<b>PrivInvInc</b>	-	-	0,18 [4.59]***	-	-
<b>D1</b>	0,1 [0.68]	-0,28 [-1.53]	-0,07 [-1]	0,28 [4.70]***	0,12 [3.26]***
<b>D2</b>	0,08 [0.8]	-0,05 [-0.42]	-0,08 [-1.74]*	0,09 [0.09]***	-0,02 [-0.97]
<b>Constant</b>	2,65 1,56	-2,46 [-1.23]	2,67 [4.32]***	9,84 [18.22]***	2,69 [6.9]***
<b>Ad. R<sup>2</sup></b>	-0,02	0,48	0,69	0,78	0,16
<b>Number of Obs.</b>	79	79	78	78	78

1) \*, \*\*, \*\*\* represent % 10, % 5 and % 1 significance levels, respectively.

2) All variables are real and in per capita terms. They are all in log terms except EXPm/EXPc.

3) t-statistics are given in brackets.

4) Variable descriptions can be found in the Appendix1.

TABLE 2.b

Dependent Variables ---->	PubInvExp	PrivInvInc	PPDoctor	SPTeacher
<b>GDP</b>	1,39 [2.44]**	-0,009 [-0.01]	-0,8 [-2.11]*	-0,52 [-1.68]
<b>VAagr</b>	-0,02 [-0.07]	-0,26 [-1.11]	-	-
<b>EXPm</b>	-	-	-0,04 [-0.19]	0,23 [0.97]
<b>EXPc</b>	-	-	-0,65 [-4.39]***	-0,1 [-0.66]
<b>TOP20/GDP</b>	-0,77 [-1.92]*	-0,69 [-0.93]	-	-
<b>BOT20/GDPi</b>	0,5 [1.63]	-0,95 [-1.92]*	-0,32 [-1.89]*	-0,14 [-0.88]
<b>Constant</b>	-3,25 [-0.68]	8,76 [1.38]	12,26 [5.56]***	4,03 [2.27]**
<b>Ad. R<sup>2</sup></b>	0,25	0,42	0,61	-0,05
<b>Number of Obs.</b>	19	19	18	18

1) \*, \*\*, \*\*\* represent % 10, % 5 and % 1 significance levels, respectively.

2) All variables are real and in per capita terms. They are all in log terms except income distribution variables.

3) t-statistics are given in brackets.

4) Variable descriptions can be found in the Appendix1.



TABLE 3

Dependent Variables --->	VOLGDP	VOLEXPc	GrGDP
VAagr	-0,05 [-2.24]**	-0,92 [-5.57]***	-
VOLEXPc	-0,03 [-2.44]**	-	-
EXPm/EXPc	0,01 [0.4]	-	-
TAXm/TAXc	-0,04 [-1.55]	-	-
PrivInvInc	-	-	0,02 [2.57]**
PubInvExp	-	-	-0,002 [-0.18]
EXPm	-	-	-0,03 [-1.39]
EXPc	-	-	-0,025 [-1.3]
D1	0,02 [1.48]	0,08 [0.55]	0,028 [1.25]
D2	0,01 [1.13]	-0,26 [-3.5]***	-0,01 [-0.97]
Constant	0,71 [2.98]***	16,7 [15.93]***	0,24 [1.98]**
Ad. R <sup>2</sup>	0,1	0,33	0,12
Number of Obs.	76	79	74

1) \*, \*\*, \*\*\* represent % 10, % 5 and % 1 significance levels, respectively.

2) All variables are real and in per capita terms. EXPm, EXPc, Vaagr, PrivInvInc and PubInvExp variables are in log terms.

3) t-statistics are given in brackets.

4) Variable descriptions can be found in the Appendix1.

TABLE 4		EXPM/EXPC	EXPM/EXPC	TAXm/TAXc	TAXm/TAXc	rGDPpc	rTAXcpc	rTAXmpc	rEXPcpc
		EXPM,i / EXPC,i (1995)	EXPM,i / EXPC,i (1998)	TAXm,i / TAXc,i (1995)	TAXm,i / TAXc,i (1998)	AVERAGE OF REAL GDP PER CAPITA AT 1987 PRICES IN TL	AVERAGE OF PER CAPITA REALTAX REVENUE OF CENTER IN TL	AVERAGE OF PER CAPITA REALTAX REVENUE OF MUNICIPALITIES IN TL	AVERAGE OF REAL PER CAPITA BUDGET EXPENDITURE OF CENTER IN TL
1	Adana	0,31	0,42	0,19	0,19	1599863	707804	134796	815688
2	Adıyaman	0,22	0,19	0,31	0,48	939378	118931	43571	413804
3	Afyon	0,36	0,41	0,36	0,41	872233	203364	74784	439066
4	Ağrı	0,08	0,09	0,28	0,22	295534	114473	26881**	532427
5	Amasya	0,24	0,22	0,21	0,33	954583	257049	70746	759267
6	Ankara	0,32	0,14	0,09	0,08	2145911	2462807	216767	2382433
7	Antalya	0,32	0,40	0,18	0,20	1788645	495442	91483	664746
8	Artvin	0,16	0,11	0,17	0,14	1876829	375492	51364	910620
9	Aydın	0,36	0,23	0,19	0,19	1712003	390284	72906	627388
10	Balıkesir	0,17	0,19	0,10	0,14	1548492	523024	62372	744418
11	Bilecik	0,22	0,19	0,14	0,16	2591309	479760	71478	654357
12	Bingöl	0,07	0,07	0,36	0,52	371966	87300	35375	937851
13	Bitlis	0,10	0,15	0,47	0,94	408455	80546	48080	674568
14	Bolu	0,24	0,22	0,14	0,17	1606726	357385	58043	544292
15	Burdur	0,23	0,23	0,24	0,24	1323620	303737	71660	637731
16	Bursa	0,32	0,55	0,10	0,13	2159482	1101644	126168	699597
17	Çanakkale	0,18	0,19	0,17	0,17	2064516	400940	66138	794765
18	Çankırı	0,25	0,25	0,45	0,45	770804	160080	66170	599166
19	Çorum	0,37	0,26	0,30	0,33	1161718	191168	60828	442597
20	Denizli	0,28	0,30	0,14	0,18	1677253	452272	75589	524387
21	Diyarbakır	0,19	0,17	0,56	0,68	990233	138102	71113	1088014
22	Edirne	0,12	0,14	0,07	0,11	1362691	717166	70285	1070945
23	Elazığ	0,09	0,09	0,26	0,23	1228273	284909	61384	1458517
24	Erzincan	0,25	0,26	0,71	0,76	772793	178361	126733	804557
25	Erzurum	0,11	0,14	0,28	0,54	621198	196510	71916	1206968
26	Eskişehir	0,15	0,14	0,13	0,16	1660924	715892	106828	1331045
27	Gaziantep	0,43	0,36	0,27	0,29	1286305	323061	91402	427368
28	Giresun	0,23	0,20	0,22	0,29	837562	247527	55169	512818
29	Gumushane	0,33	0,27	0,98***	0,95	624840	114716	104544	611144
30	Hakkari	0.053**	0,05	0,48	0,38	283198**	126153	39259	1402396
31	Hatay	0,34	0,25	0,15	0,17	1360897	487502	74769	455653
32	İsparta	0,23	0,24	0,21	0,29	1007956	341166	80300	937328
33	İçel	0,52	0,44	0,12	0,22	1856162	698350	110910	503924
34	İstanbul	0,58	0,55	0,09	0,09	2443562	2842880	264565***	768078
35	İzmir	0,36	0,42	0,09	0,12	2535809	1553617	172505	976711
36	Kars	0,08	0,08	0,31	0,36	475172	135139	38656	872617
37	Kastamonu	0,08	0,09	0,16	0,19	1098698	314081	52974	1206491
38	Kayseri	na	0,29	na	0,24	1090981	463956	na	942552
39	Kırklareli	0,18	0,25	0,10	0,11	2515980	678113	69787	698640
40	Kırşehir	0,28	0,29	0,31	0,35	965637	221594	66803	525084
41	Kocaeli	0.670***	0.815***	0.03**	0.03**	4064542***	7500980***	230216	856194
42	Konya	0,28	0,40	0,31	0,39	1140874	299565	94426	605647
43	Kütahya	0,36	0,28	0,11	0,18	1342992	432487	56399	446370
44	Malatya	0,14	0,17	0,25	0,31	1123714	207810	52100	788428
45	Manisa	0,35	0,32	0,18	0,18	2068415	399949	72400	415147
46	K.Maraş	0,25	0,21	0,25	0,29	990784	194150	53238	446976
47	Mardin	0,23	0,18	0,76	0,53	681181	109685	57784	624831
48	Muğla	0,36	0,32	0,16	0,17	2151837	547727	90094	581527
49	Muş	0,14	0,13	0,63	0,63	363401	64805**	35534	522141
50	Nevşehir	0,47	0,40	0,34	0,38	1736203	233541	79022	488630
51	Niğde	0,31	0,26	0,26	0,33	1209477	262126	77468	607951
52	Ordu	0,40	0,35	0,37	0,39	742836	180039	70908	351392**
53	Rize	0,32	0,23	0,14	0,13	1316230	473700	56790	524270
54	Sakarya	0,36	0,28	0,20	0,25	1396955	338753	79676	562853
55	Samsun	0,17	0,16	0,17	0,21	1227588	423505	71857	876572
56	Siirt	0,09	0,08	0,50	0,62	696136	94588	46663	997053
57	Sinop	0,22	0,19	0,33	0,32	903682	205871	62578	672015
58	Sivas	0,15	0,15	0,26	0,27	841438	223078	57278	872630
59	Tekirdağ	0,18	0,30	0,08	0,10	2078740	850124	75384	655889
60	Tokat	0,36	0,32	0,46	0,50	926556	152353	69939	439104
61	Trabzon	0,13	0,14	0,18	0,26	1022333	317909	61214	976728
62	Tunceli	0,11	0,08	0,77	0,61	608363	194857	128619	2238035***
63	Urfa	0,20	0,20	0,58	0,37	705363	108464	45187	457619
64	Uşak	0,28	0,29	0,18	0,19	1155073	313860	57516	486627
65	Van	0,07	0,07	0,31	0,31	496082	143997	37052	1033536
66	Yozgat	0,32	0,26	0,40	0,35	685211	139880	46355	385926
67	Zonguldak	0,60	0,35	0,12	0,12	1345374	898754	97769	544691
68	Aksaray	0,46	0,29	0,48	0,27	729317	182063	61064	369818
69	Bayburt	0,17	0,22	0,42	0,64	729317	104742	56717	615916
70	Karaman	0,38	0,34	0,33	0,37	1635937	214728	71510	436663
71	Kırıkkale	0,31	0,31	0,24	0,22	1638423	438861	92114	507885
72	Batman	0,15	0,12	0,28	0,38	940574	153635	37964	521295
73	Şırnak	0,05	0.05**	0,56	0,20	332998	120926	33471	1103240
74	Bartın	0,19	0,13	0,22	0,17	658462	249031	45427	525349
75	Ardahan	0,09	0,09	0,39	0,24	428477	154467	34525	774387
76	İğdır	0,12	0,06	0,42	0,21	494829	154402	36582	728713
77	Yalova	na	0,34	na	0,16	3369140	523086	100732	454239
78	Karabük	na	0,27	na	0,32	3101127	419810	127152	532633
79	Kilis	na	0,20	na	1.23***	1470355	125711	96246	513434
80	Osmaniye	na	na	na	na	1010922	112369	na	378008
81	Düzce	na	na	na	na	na	na	na	na
Average		0,13	0,11	0,11	0,11	1585302	1049253	118150	1802332

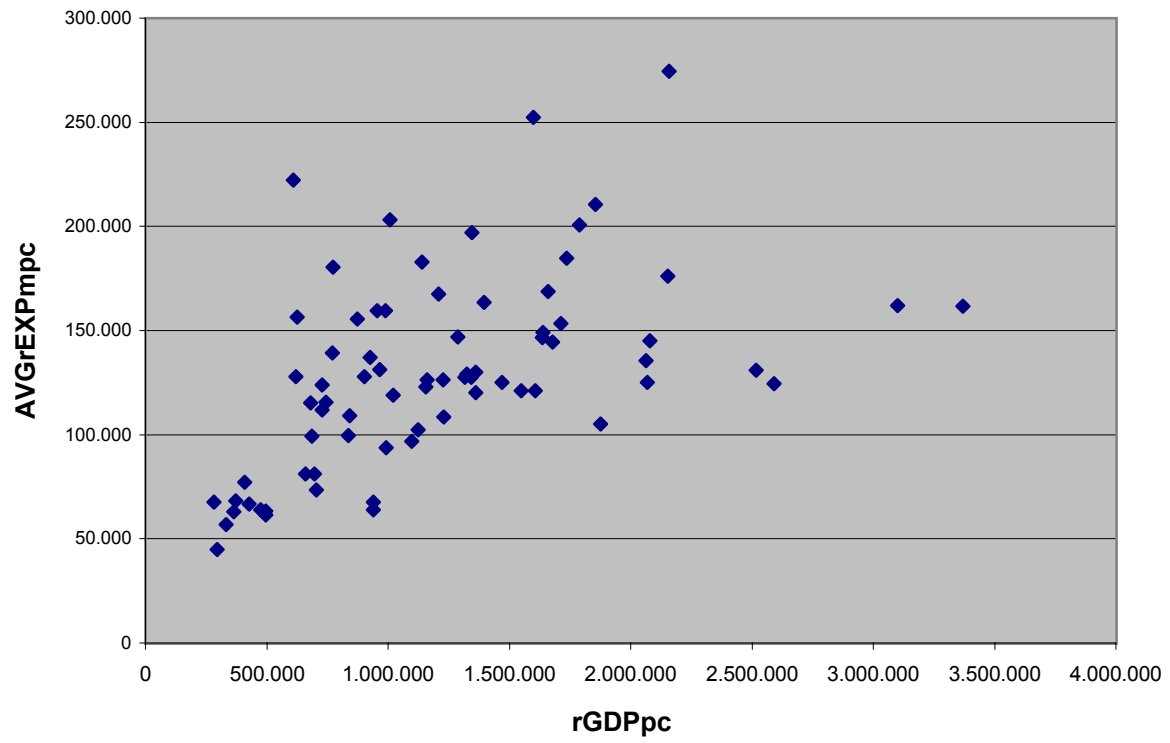
Note: \*\*, \*\*\* represent minimum and maximum of the column, respectively.

		rEXPmpc	rPubInvExppc	rPrivInvExppc	rVaagrpc	BOT20pc	TOP20pc	TOP20pc/GDPpc
		AVERAGE OF REAL PER CAPITA BUDGET EXPENDITURE OF MUNICIPALITIES IN TL	AVERAGE OF REAL PER CAPITA PUBLIC INVESTMENT EXPENDITURE IN TL	AVERAGE OF REAL PER CAPITA PRIVATE SECTOR INVESTMENT INCENTIVES IN TL	AVERAGE OF REAL PER CAPITA AGRICULTURAL VALUE ADDED IN TL	PER CAPITA TOTAL REVENUE OF BOTTOM % 20 PER MONTH IN TL	PER CAPITA TOTAL REVENUE OF TOP % 20 PER MONTH IN TL	TOP20pc / GDPpc in Turkey
1	Adana	252344	72121	1171562	2375373	103812	1146126	7,60
2	Adıyaman	67636	43203	322875	1508277	na	na	na
3	Afyon	155560	39660	147585	2660057	na	na	na
4	Ağrı	44788**	35687	22882**	1646842	na	na	na
5	Amasya	159524	39465	220937	2907266	na	na	na
6	Ankara	450980	240248	767602	806976	210821	1251431	6,20
7	Antalya	200737	113801	786789	2470965	82080	548652	5,70
8	Artvin	105071	97487	94442	2068938	na	na	na
9	Aydın	153463	53274	426094	3573842	na	na	na
10	Balıkesir	121048	96293	359385	4314493	na	na	na
11	Bilecik	124525	92091	2965439	3100118	na	na	na
12	Bingöl	68128	530753***	108022	1792095	na	na	na
13	Bitlis	77022	25777	34834	1494879	na	na	na
14	Bolu	121174	64456	694327	3147471	na	na	na
15	Burdur	129240	47643	190931	3448213	na	na	na
16	Bursa	274449	163423	2966903	2017128	108442	749775	5,20
17	Çanakkale	135427	117247	617171	4700926***	na	na	na
18	Çankırı	139182	51835	1688228	2773089	na	na	na
19	Çorum	126329	84515	300539	2444782	na	na	na
20	Denizli	144371	71356	2055948	2244558	64074	461586	5,60
21	Diyarbakır	159606	141874	359961	1792305	36691**	223500**	3,40
22	Edirne	129925	143822	716223	3345113	na	na	na
23	Elazığ	108473	102294	216084	1450347	na	na	na
24	Erzincan	180539	275449	199782	2781902	na	na	na
25	Erzurum	127736	80519	91801	1708821	42893	411114	7,20
26	Eskişehir	168789	154781	1071287	1916269	132800	934011	4,80
27	Gaziantep	147026	64797	3282108	1039549	74591	391218	2,9**
28	Giresun	99728	16513	59165	1618550	na	na	na
29	Gümüşhane	156308	146233	170873	2074955	na	na	na
30	Hakkari	67519	108814	39549	1030119	na	na	na
31	Hatay	120274	62199	450285	1843133	na	na	na
32	Isparta	203062	106957	547539	2137483	na	na	na
33	İçel	210629	142663	359651	2026748	62115	377593	4,60
34	İstanbul	394890	92933	1045918	131850**	246901***	2174466***	9,4***
35	İzmir	349057	196692	934155	1440480	152753	1070833	5,90
36	Kars	63922	198090	123985	2241472	na	na	na
37	Kastamonu	96939	109751	311927	2946507	na	na	na
38	Kayseri	na	45993	1147385	1510608	64512	574635	5,20
39	Kırklareli	130799	93260	3508980	2855098	na	na	na
40	Kırşehir	131235	179740	225447	2595071	na	na	na
41	Kocaeli	558518***	280219	1593286	985644	47078	320756	5,00
42	Konya	183019	67851	148512	2364111	44208	300414	4,30
43	Kütahya	127460	111294	392954	1891029	na	na	na
44	Malatya	102450	177385	1073576	1187468	66491	390641	4,40
45	Manisa	125146	121049	355472	3082922	na	na	na
46	K. Maraş	93810	113702	2608305	1537514	na	na	na
47	Mardin	115290	27946	319415	1701119	na	na	na
48	Muğla	176160	497173	807307	3398768	na	na	na
49	Muş	63015	61119	33343	2293209	na	na	na
50	Nevşehir	184768	108230	306574	4137881	na	na	na
51	Niğde	167490	58778	822755	3454264	na	na	na
52	Ordu	115508	26552	113424	1401336	na	na	na
53	Rize	127675	50435	70096	1534513	na	na	na
54	Sakarya	163536	42226	793948	3176111	na	na	na
55	Samsun	126394	127146	161200	2197031	54287	337515	4,80
56	Siirt	81178	43746	44650	1377601	na	na	na
57	Sinop	127982	108682	146514	2016939	na	na	na
58	Sivas	109049	204098	283154	2591006	na	na	na
59	Tekirdağ	145158	161352	9339904***	2531264	na	na	na
60	Tokat	137091	35729	209624	2300653	na	na	na
61	Trabzon	118997	78535	112913	1176179	37711	335102	8,10
62	Tunceli	222308	228741	23016	2394736	na	na	na
63	Urfa	73449	326877	361774	2148099	na	na	na
64	Uşak	123001	29609	715405	2531621	na	na	na
65	Van	63415	91654	45793	1128671	na	na	na
66	Yozgat	99258	83271	128239	2943882	na	na	na
67	Zonguldak	196995	236541	1170027	789824	39283	225393	5,00
68	Aksaray	124015	39886	315151	2584799	na	na	na
69	Bayburt	112008	111461	73210	2006351	na	na	na
70	Karaman	146551	104860	928183	4636169	na	na	na
71	Kırıkkale	148928	222777	208526	1390006	na	na	na
72	Batman	63974	62295	135437	1503971	na	na	na
73	Şirnak	56953	40348	109911	1864953	na	na	na
74	Bartın	81070	41698	831849	1185467	na	na	na
75	Ardahan	66560	23675	71988	3744971	na	na	na
76	İğdır	61590	296951	580634	2218533	na	na	na
77	Yalova	161792	29637	984947	1313015	na	na	na
78	Karabük	162131	19590	1642549	990394	na	na	na
79	Kilis	125240	32201	270321	2201706	na	na	na
80	Osmaniye	na	11278**	50961	na	na	na	na
81	Düzce	na	na	na	na	na	na	na
	Average	215278	346914	889181	1761935	na	na	na

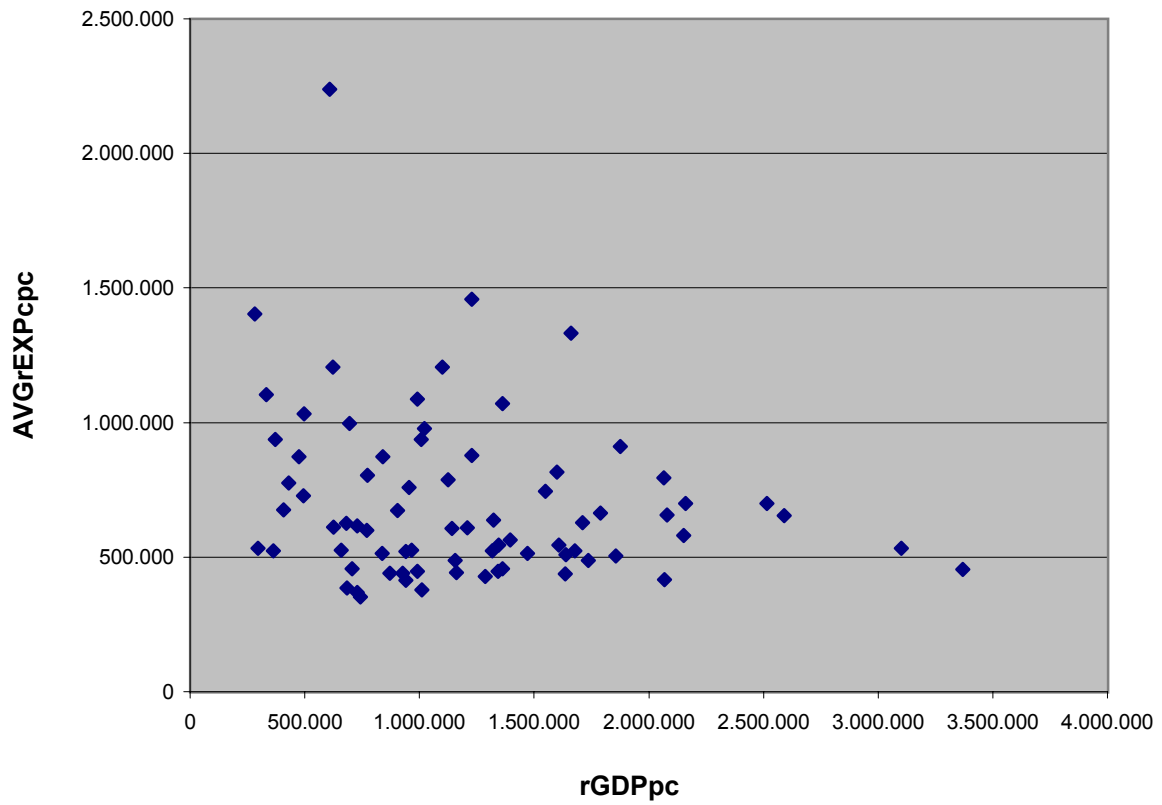
		BOT20pc / GDPpci	TOP20 / BOT20	PPDoctor	SPTeacher	rgrGDPpc	NuTAXp	rPersEXPcpc	D1	D2
		BOT20pc / GDPi pc	TOP20 / BOT20	PEOPLE PER DOCTOR (1996)	NUMBER OF STUDENTS / NUMBER OF TEACHERS 1996	AVERAGE OF GDP PER CAPITA GROWTH RATE AT 1987 PRICES	NUMBER OF TAX PAYERS	AVERAGE OF PER CAPITA REAL BUDGET EXPENDITURE FOR PERSONNEL IN TL	EMERGENCY STATE REGIONS (DUMMY)	PRIORITY REGIONS FOR DEVELOPMENT (DUMMY)
1	Adana	0,53	11***	993	29	0,06	135755	548392	0	0
2	Adıyaman	na	na	2779	26	0,01	22736	342589	0	1
3	Afyon	na	na	2023	23	0,03	52214	337400	0	0
4	Ağrı	na	na	3366	31	0,03	15718	377355	0	1
5	Amasya	na	na	1373	18	0,03	25461	611893	0	1
6	Ankara	0,72	6,00	329**	19	0,04	383514	839940	0	0
7	Antalya	0,75	7,00	787	17	0,07	187841	437441	0	0
8	Artvin	na	na	1090	20	0,03	187841	652397	0	1
9	Aydın	na	na	969	15	0,04	101632	430432	0	0
10	Balıkesir	na	na	1257	16	0,02	117646	533912	0	0
11	Bilecik	na	na	1218	19	0,07	14001	440335	0	0
12	Bingöl	na	na	2355	22	0,03	9342	717268	0	1
13	Bitlis	na	na	2939	25	0,02	11527	503618	0	1
14	Bolu	na	na	1498	23	0,03	52322	409496	0	0
15	Burdur	na	na	1235	16	0,04	25331	520410	0	0
16	Bursa	0,56	6,91	934	21	0,04	198607	390827	0	0
17	Çanakkale	na	na	1201	18	0,03	45932	600554	0	1
18	Çankırı	na	na	1680	14	0,02	9786	459855	0	1
19	Çorum	na	na	1564	20	0,04	39947	350582	0	1
20	Denizli	0,85	7,20	1116	17	0,05	84989	387430	0	0
21	Diyarbakır	0,82	6,00	1610	31	0,01	51618	696512	1	1
22	Edirne	na	na	645	20	0,04	41612	713720	0	0
23	Elazığ	na	na	792	22	0,00	31555	1003168	0	1
24	Erzincan	na	na	1370	19	0,01	14575	603096	0	1
25	Erzurum	1,66***	9,60	1023	23	0,00	38666	705669	0	1
26	Eskişehir	0,63	7,00	686	21	0,04	55774	893410	0	0
27	Gaziantep	0,63	5,00**	1771	34	0,04	87375	302896	0	0
28	Giresun	na	na	1988	26	0,03	32074	396688	0	0
29	Gümüşhane	na	na	1658	23	0,02	7595	478413	0	1
30	Hakkari	na	na	3629	32	0,08	4822	1059805	1	1
31	Hatay	na	na	1801	32	0,04	100412	326156	0	0
32	Isparta	na	na	795	15	0,05	30167	595349	0	0
33	İçel	0,60	6,00	1830	22	0,04	133067	378562	0	0
34	İstanbul	0,73	9,00	567	33	0,06	1379030***	373413	0	0
35	İzmir	0,54	7,00	479	18	0,05	377220	584018	0	0
36	Kars	na	na	2131	27	0,03	15354	627419	0	1
37	Kastamonu	na	na	1124	19	0,04	17325	740073	0	1
38	Kayseri	0,80	8,90	920	30	0,05	64996	641973	0	0
39	Kırklareli	na	na	1106	22	0,02	33835	533195	0	0
40	Kırşehir	na	na	1479	29	0,02	13992	427678	0	0
41	Kocaeli	0,26**	6,81	1139	24	0,06	107579	638988	0	0
42	Konya	0,85	7,00	1274	20	0,03	141543	420194	0	0
43	Kütahya	na	na	1431	22	0,04	43630	340172	0	0
44	Malatya	1,13	5,90	1172	25	0,04	46812	572699	0	1
45	Manisa	na	na	1057	18	0,05	122136	325979	0	0
46	K.Maraş	na	na	2201	27	0,02	53678	316914	0	1
47	Mardin	na	na	3124	33	0,08	45739	495355	0	1
48	Muğla	na	na	1058	16	0,06	90577	459396	0	0
49	Muş	na	na	3464	27	0,01	7171	397662	0	1
50	Nevşehir	na	na	1371	19	0,05	24928	386407	0	0
51	Niğde	na	na	1387	23	0,03	21514	423442	0	0
52	Ordu	na	na	2222	24	0,04	47515	278678	0	0
53	Rize	na	na	1373	28	0,01	27410	365573	0	0
54	Sakarya	na	na	1581	25	0,06	76884	407803	0	0
55	Samsun	1,08	6,00	1002	23	0,02	85804	538206	0	0
56	Siirt	na	na	2558	23	0,04	8221	795272	1	1
57	Sinop	na	na	1192	13**	0,02	18270	536820	0	1
58	Sivas	na	na	1058	26	0,03	46453	598205	0	0
59	Tekirdağ	na	na	996	21	0,07	63158	466312	0	0
60	Tokat	na	na	1862	25	0,04	39833	355258	0	1
61	Trabzon	1,18	9,00	779	24	0,02	60120	597792	0	0
62	Tunceli	na	na	1239	22	(-0,026)**	3747**	1648677***	1	1
63	Urfa	na	na	3068	25	0,10	78182	277996	0	1
64	Uşak	na	na	1402	16	0,04	30242	393052	0	0
65	Van	na	na	1975	35	0,03	30589	727038	1	1
66	Yozgat	na	na	1963	18	0,02	29253	307988	0	1
67	Zonguldak	0,71	6,00	1349	24	0,05	56344	405893	0	1
68	Aksaray	na	na	1574	25	0,09	20310	274466	0	0
69	Bayburt	na	na	1505	18	0,07	5569	443853	0	1
70	Karaman	na	na	1539	22	0,09	14197	300094	0	0
71	Kırıkkale	na	na	1806	26	0,04	19650	377480	0	1
72	Batman	na	na	3326	33	na	20126	411553	0	1
73	Şırnak	na	na	4897***	37***	0,156***	14523	849993	1	1
74	Bartın	na	na	1499	16	0,08	16349	355583	0	1
75	Ardahan	na	na	1517	28	0,07	6216	448805	0	1
76	Iğdır	na	na	1762	24	0,07	9875	403052	0	1
77	Yalova	na	na	1242	20	na	21171	194751	0	0
78	Karabük	na	na	1397	20	na	22622	219282	0	1
79	Kilis	na	na	2656	18	na	9008	214624	0	1
80	Osmaniye	na	na	2589	na	na	26247	143243**	0	1
81	Düzce	na	na	na	na	na	na	na	0	0
	Average	na	na	907	23	0,04	5695113	520458	0	0

## **APPENDIX 3: Figures**

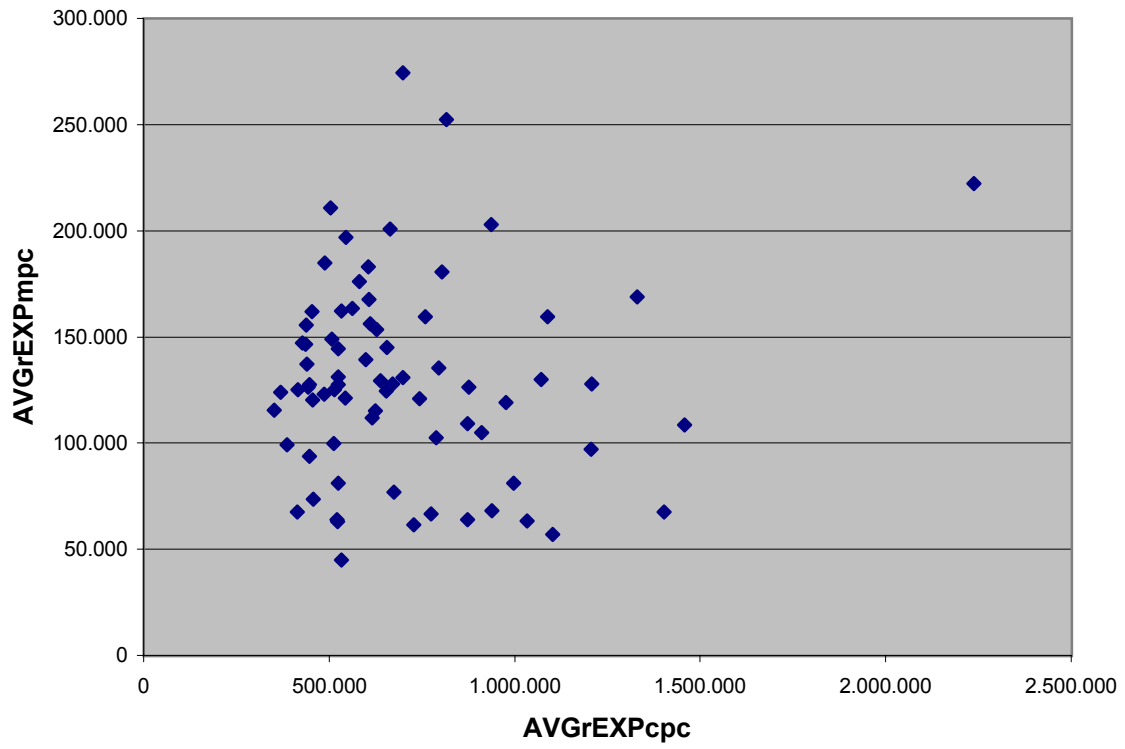
**Figure 1.1**



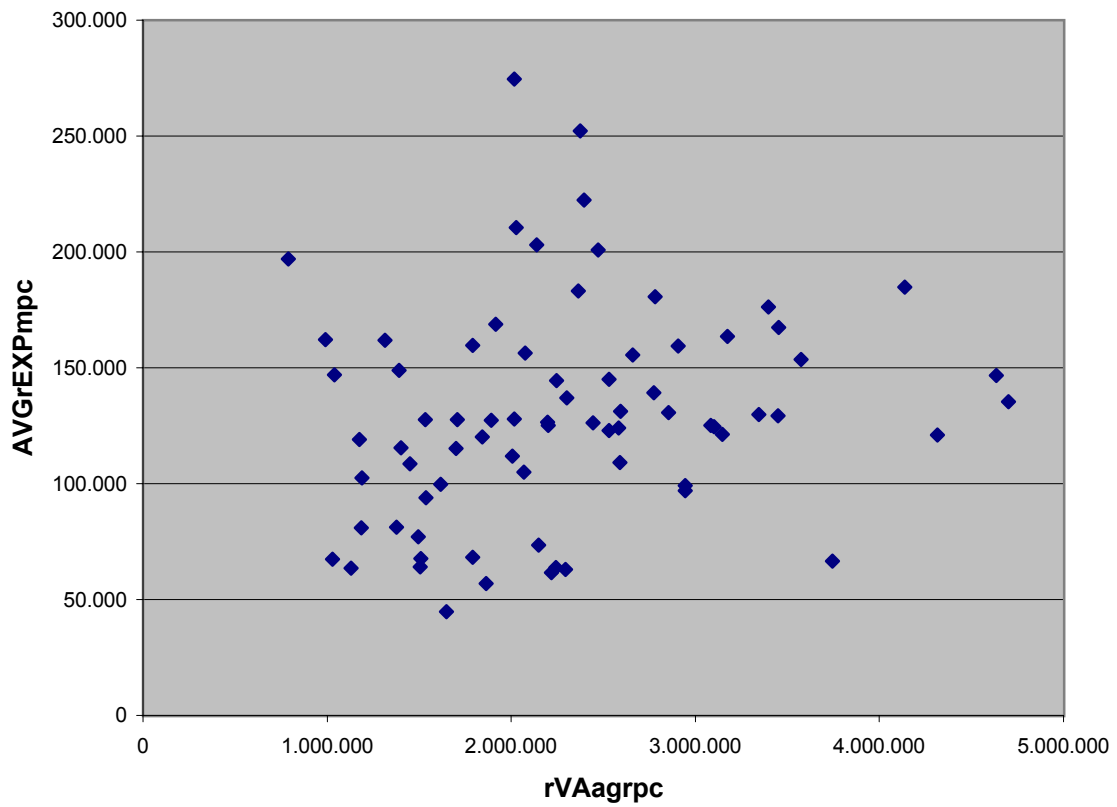
**Figure 1.2**



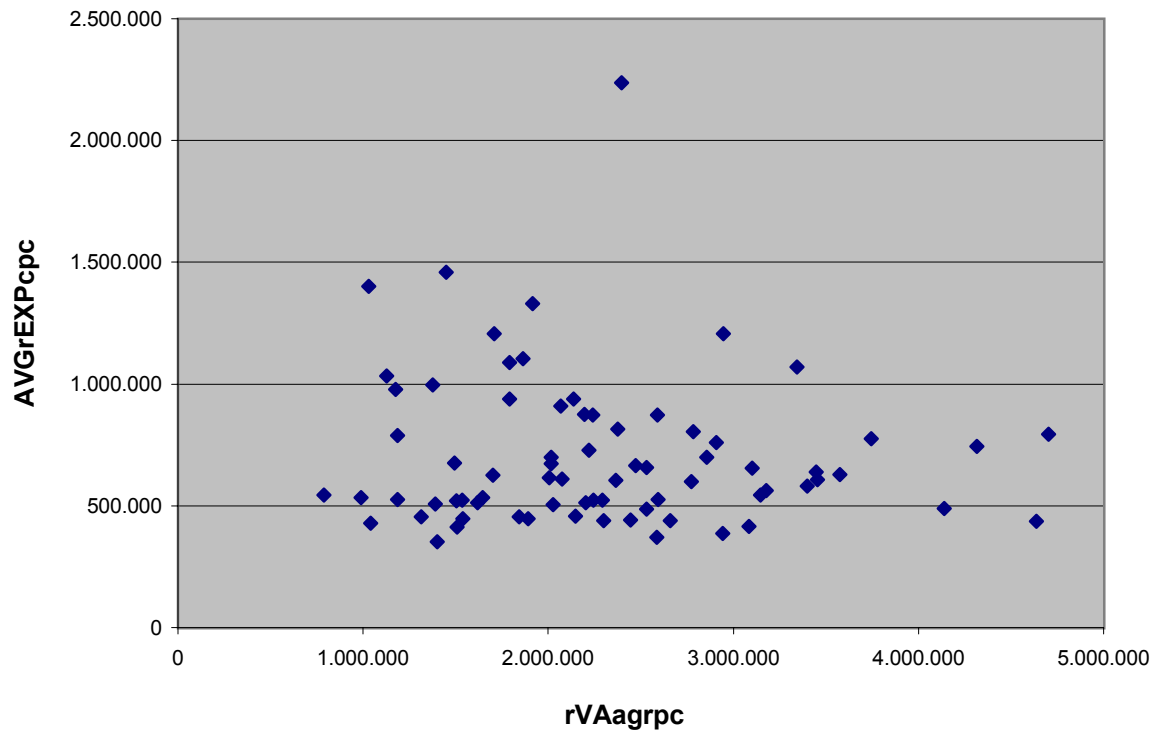
**Figure 1.3**



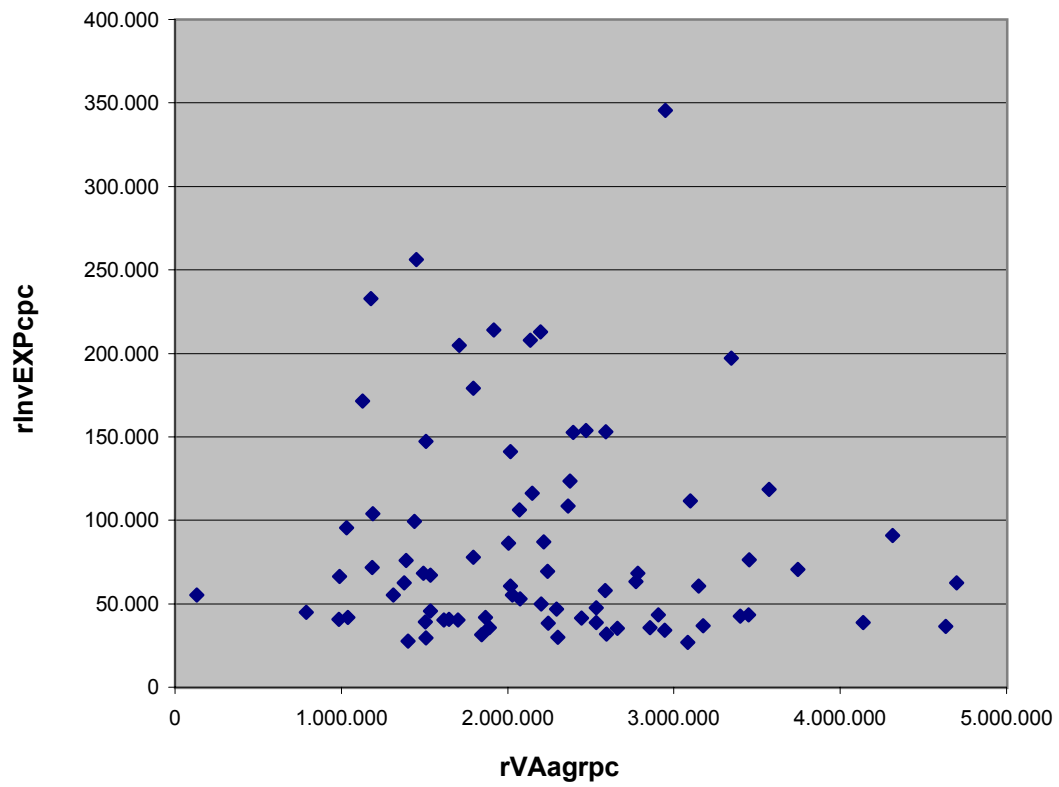
**Figure 1.4**



**Figure 1.5**

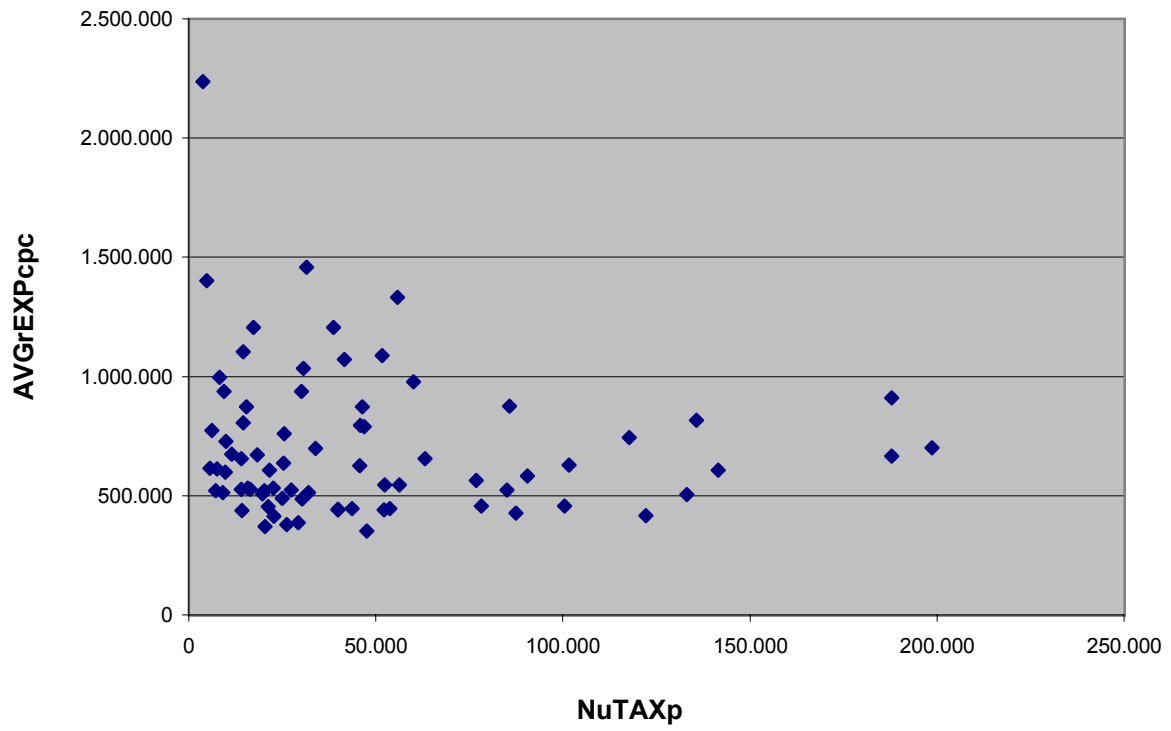


**Figure 1.6**

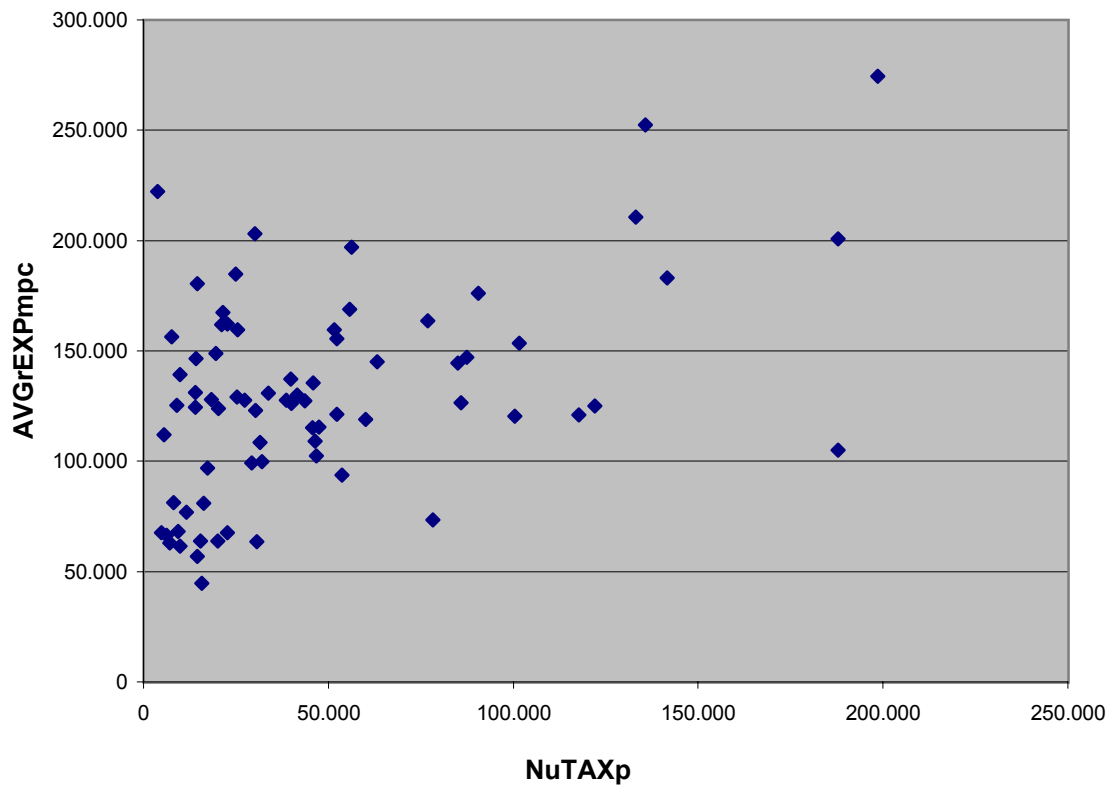


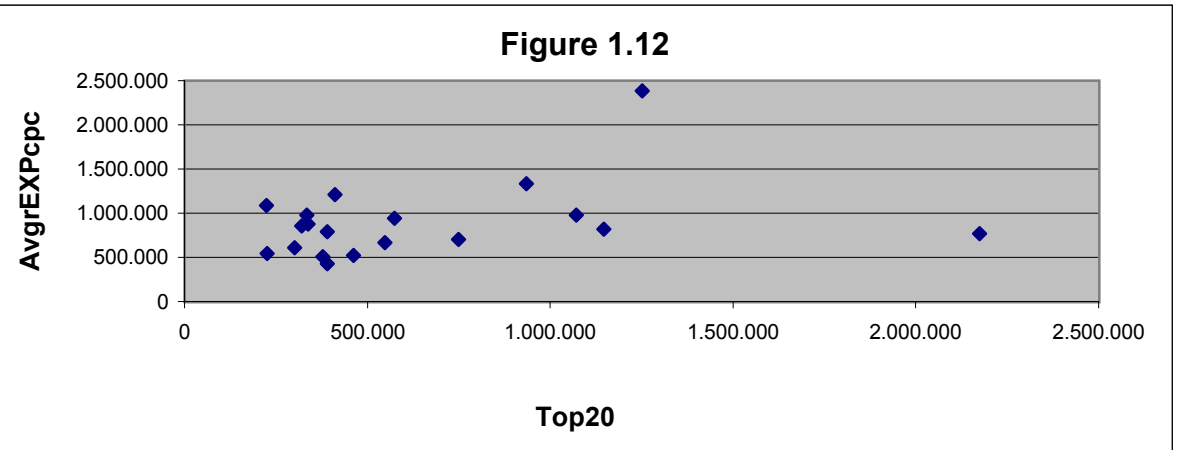
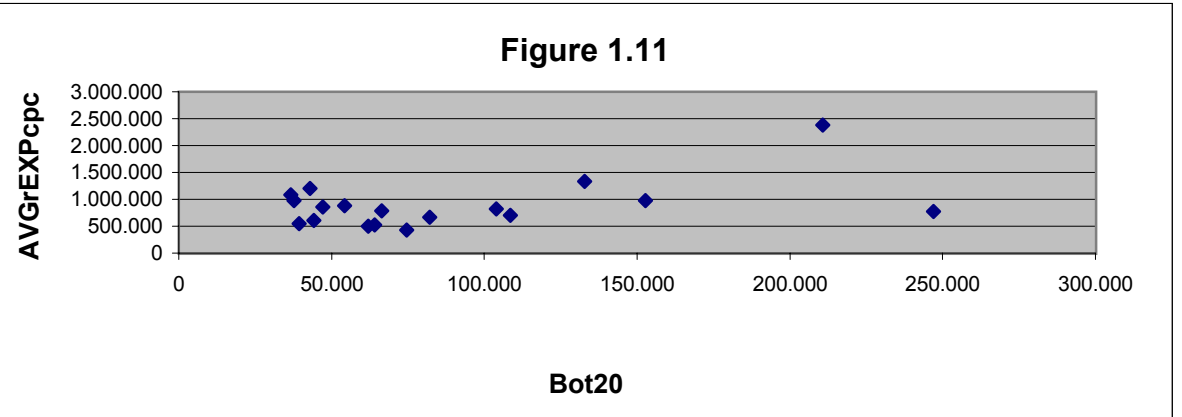
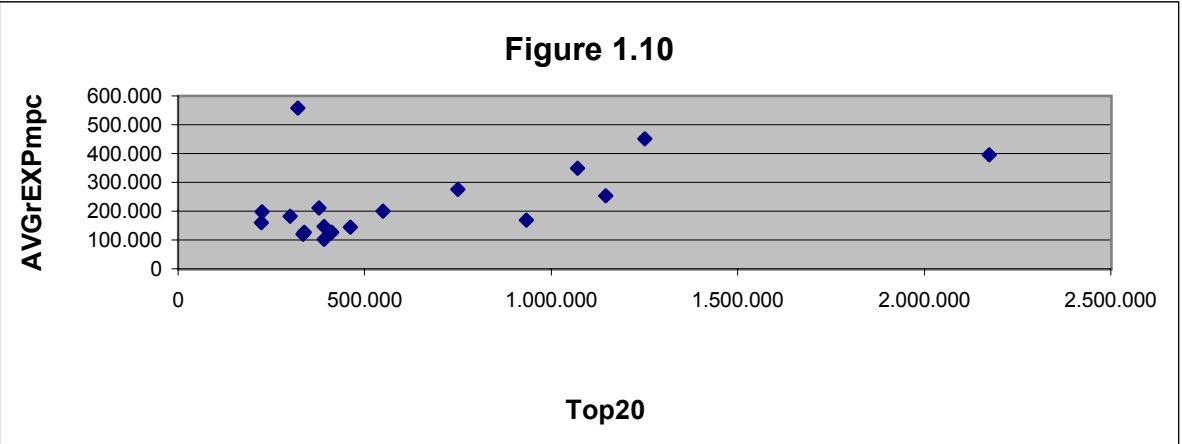
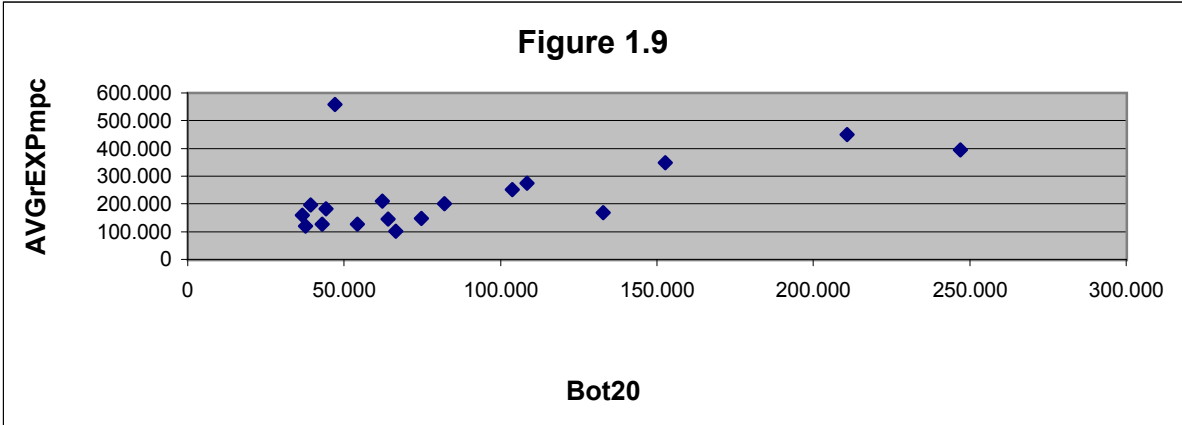


**Figure 1.7**

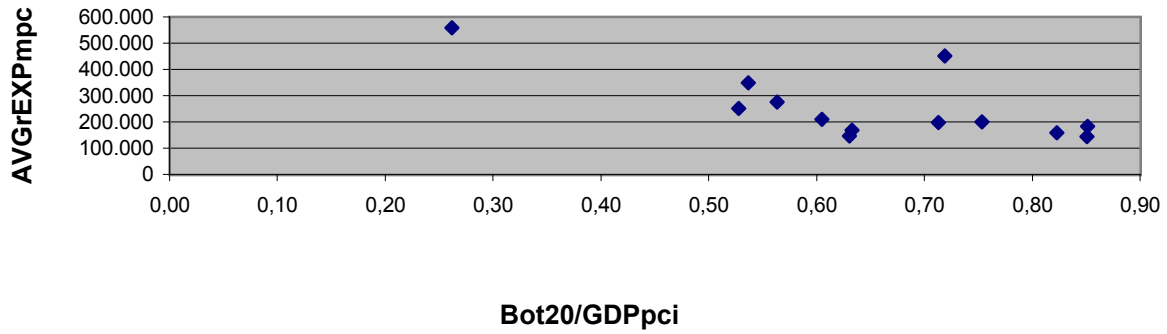


**Figure 1.8**

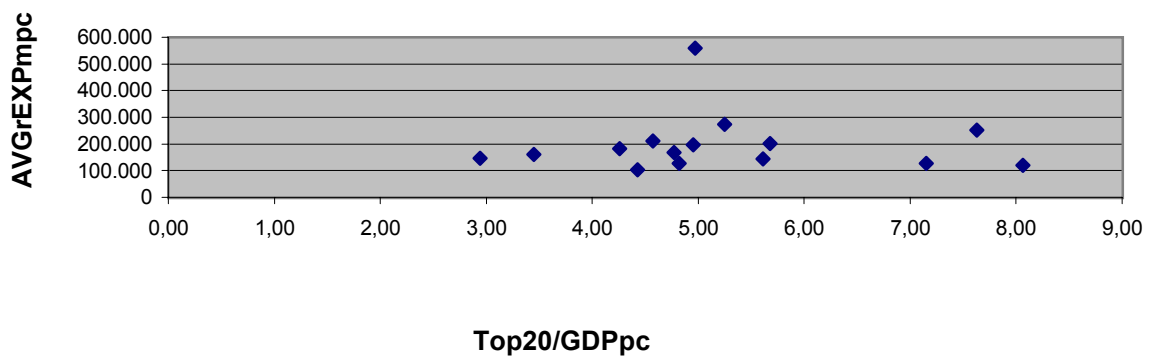




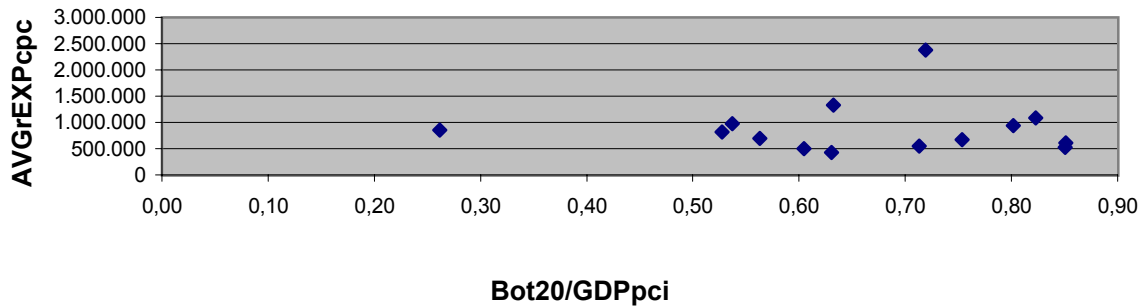
**Figure 1.13**



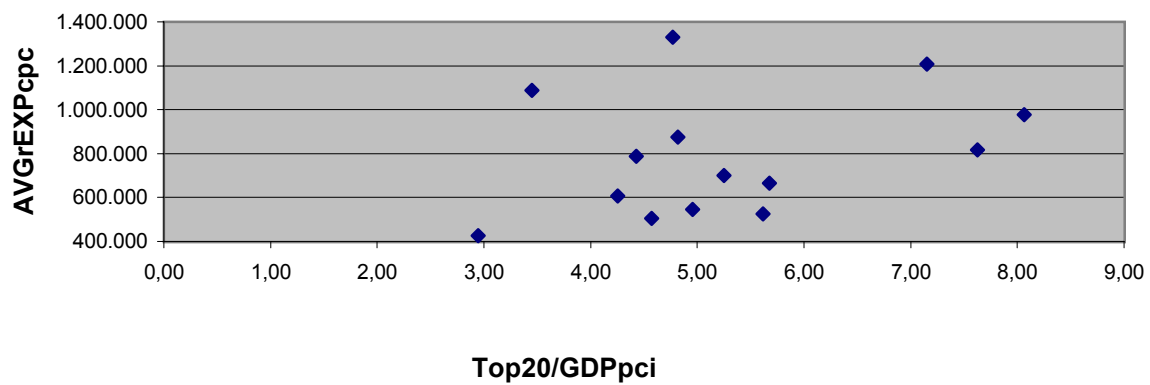
**Figure 1.14**



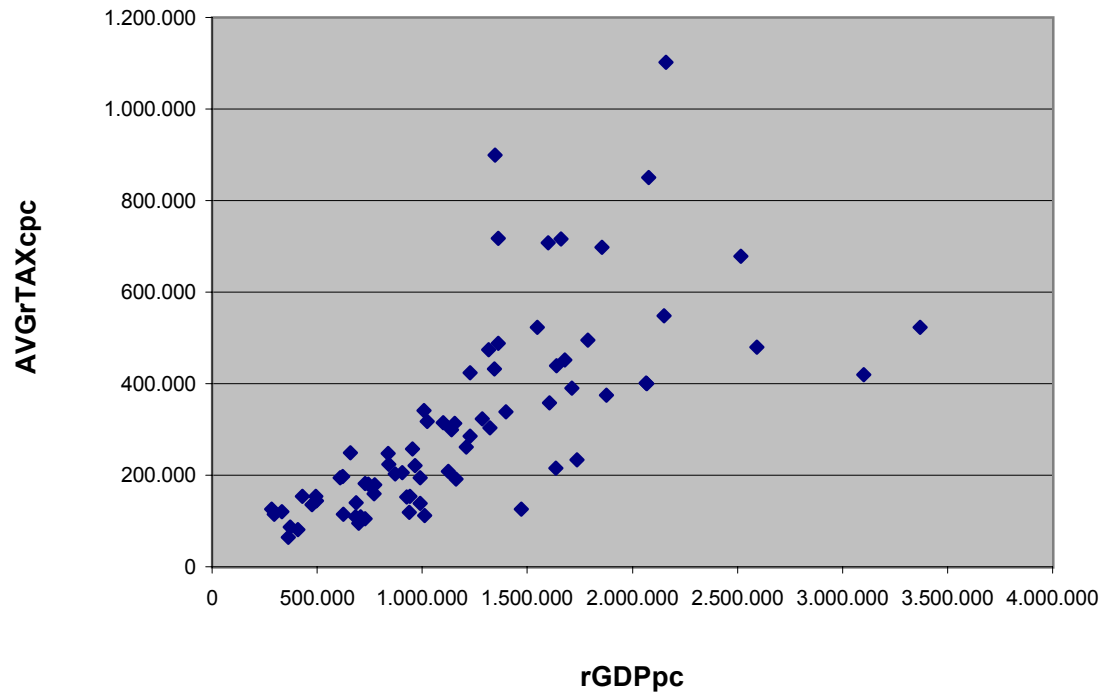
**Figure 1.15**



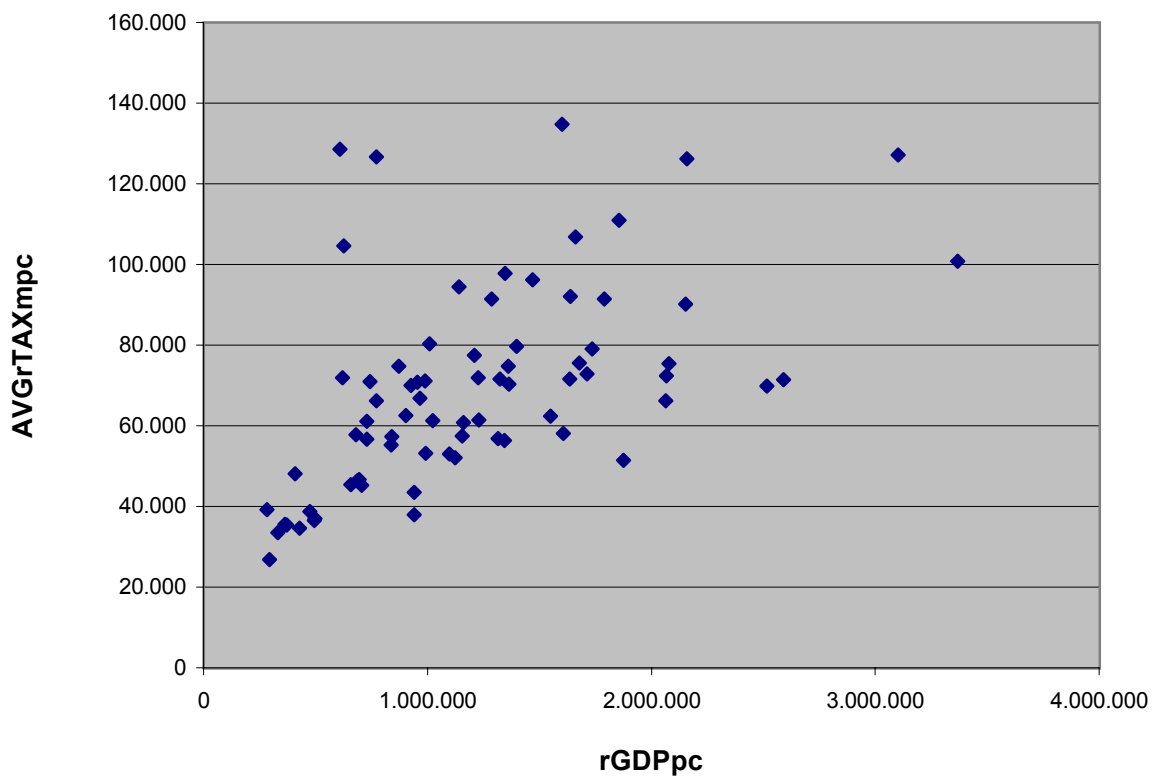
**Figure 1.16**



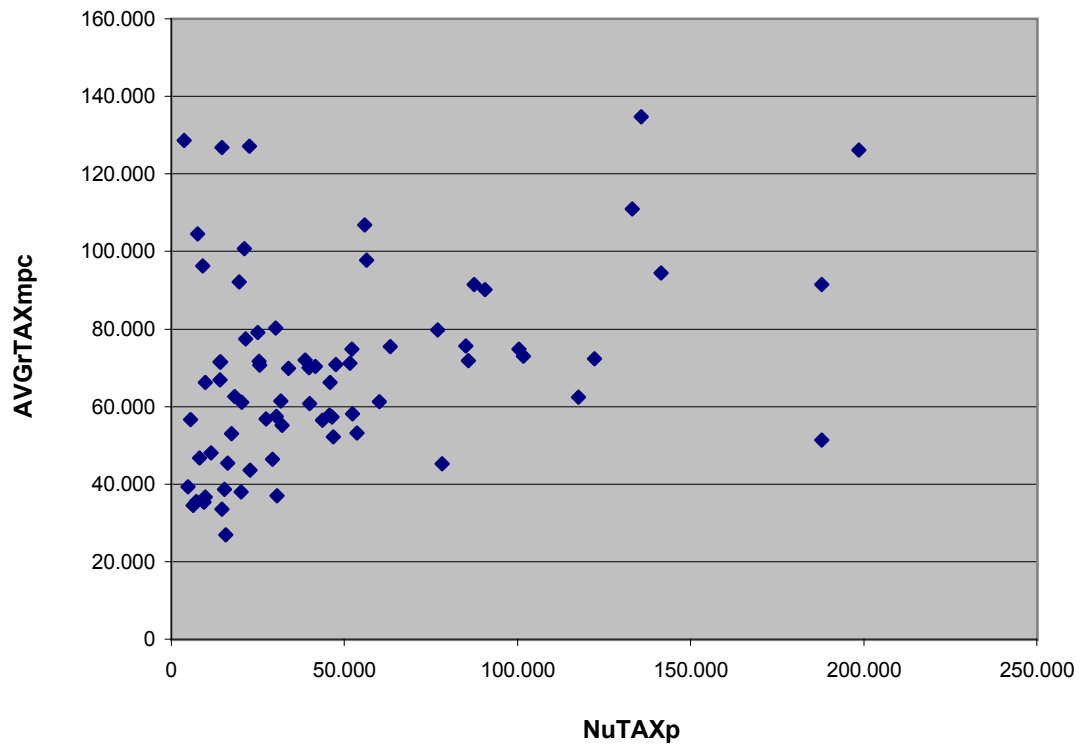
**Figure 2.1**



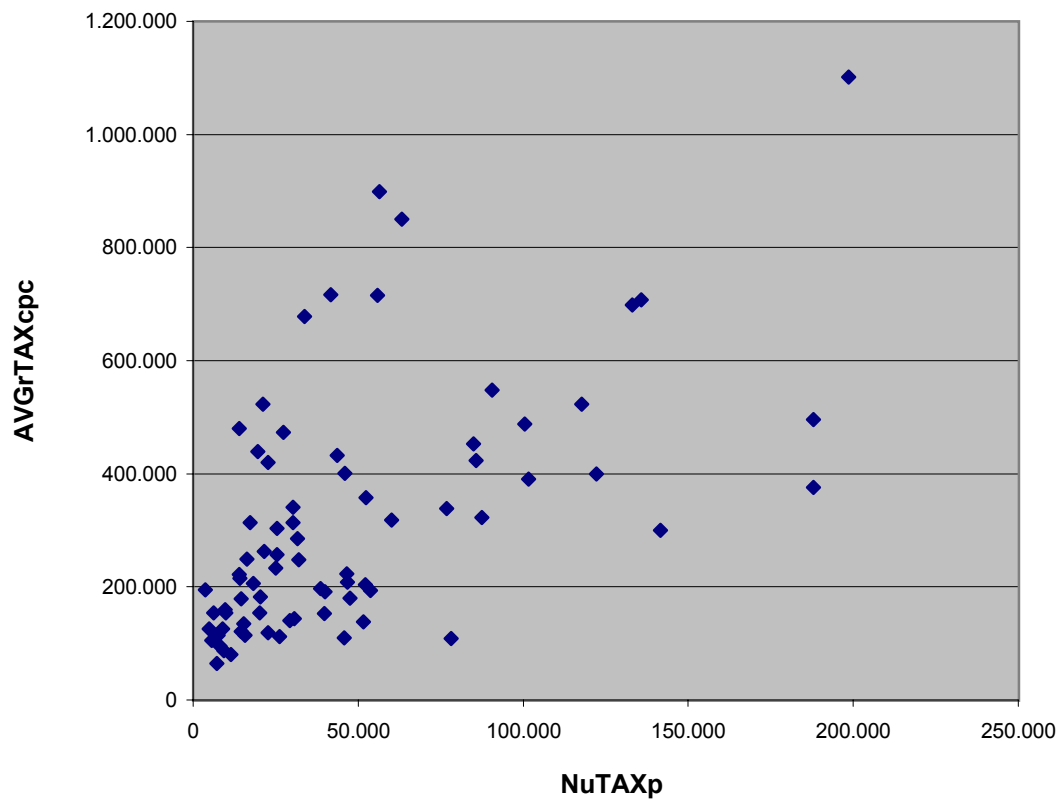
**Figure 2.2**



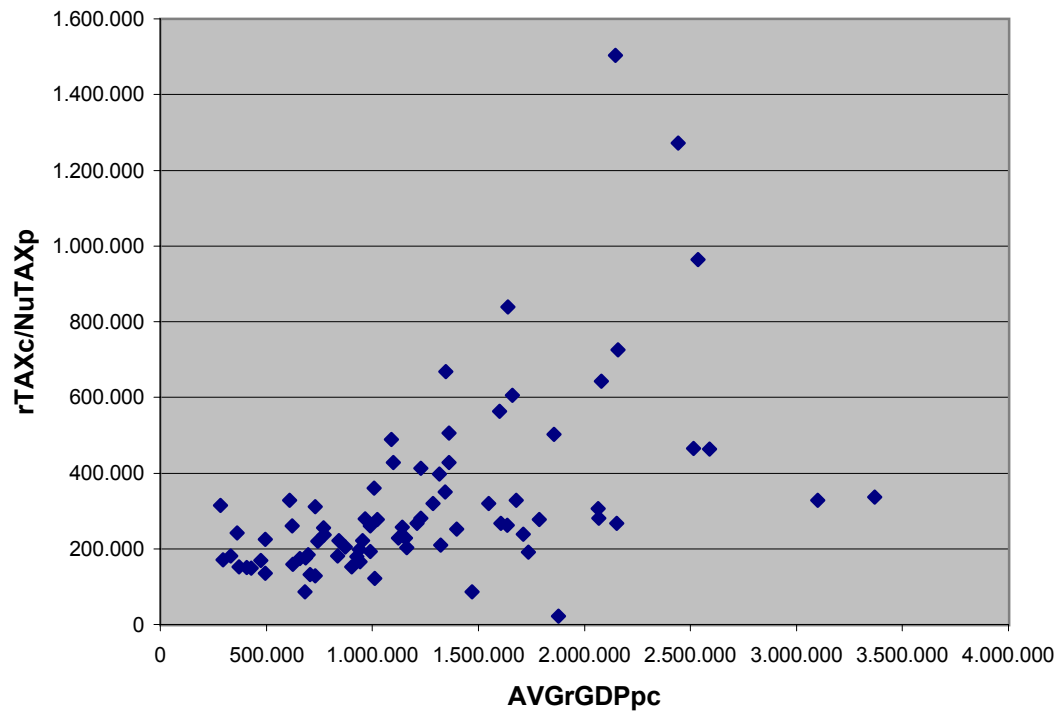
**Figure 2.3**



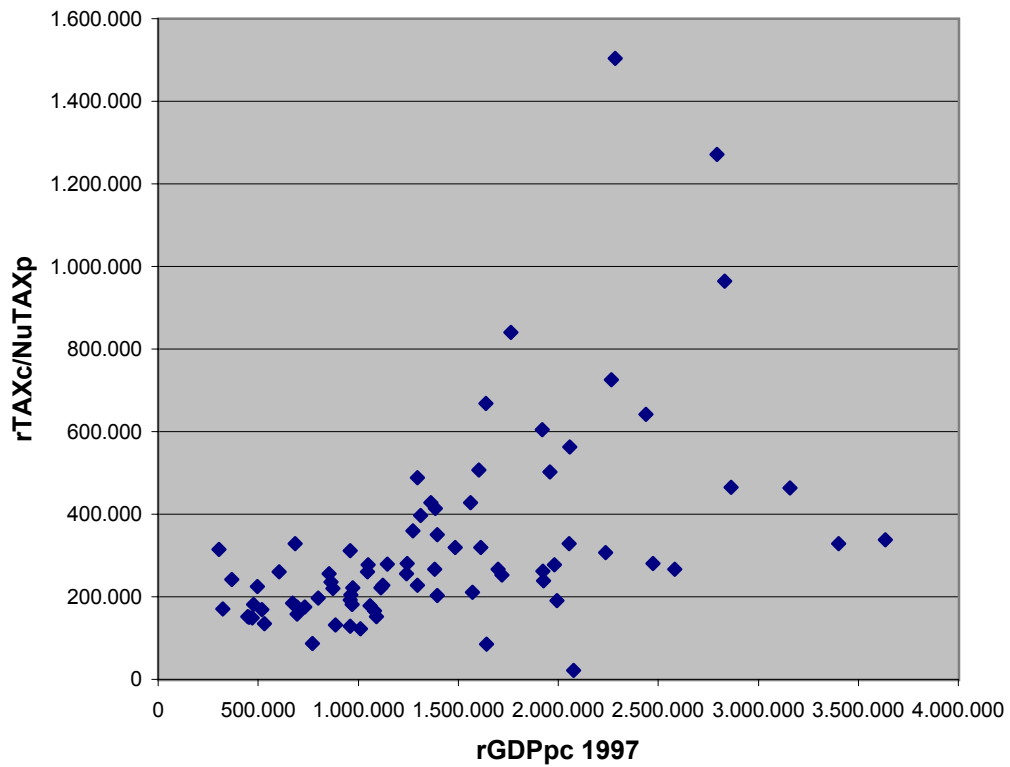
**Figure 2.4**



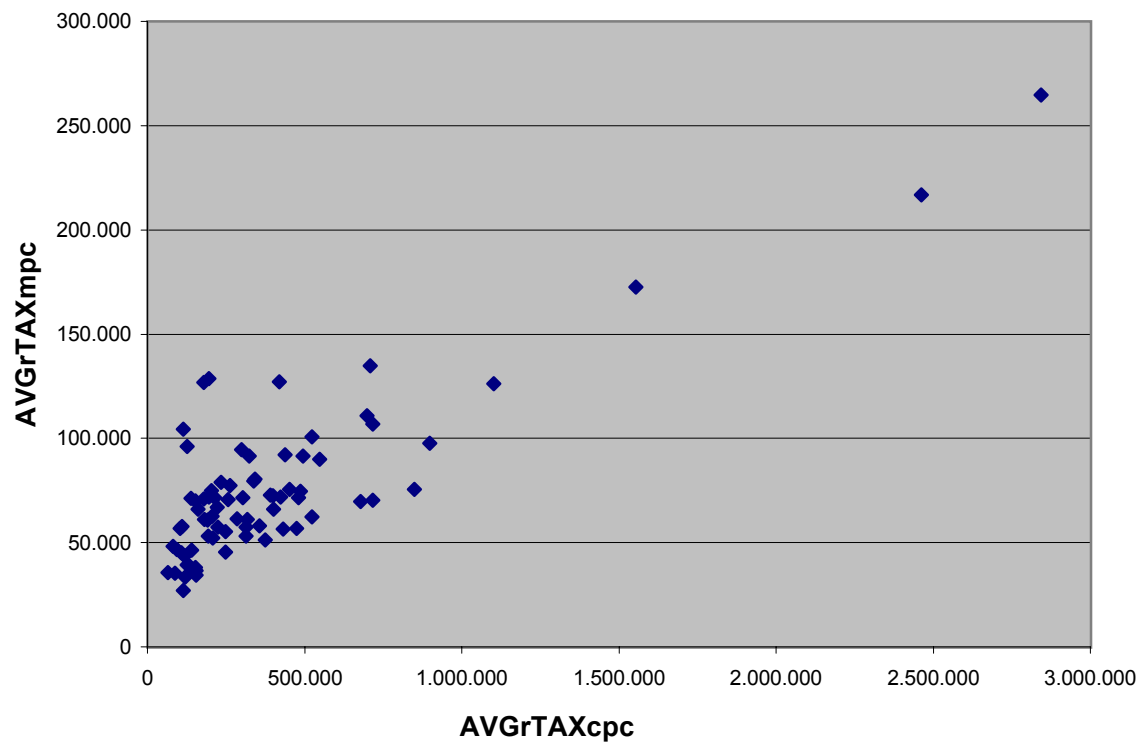
**Figure 2.5**



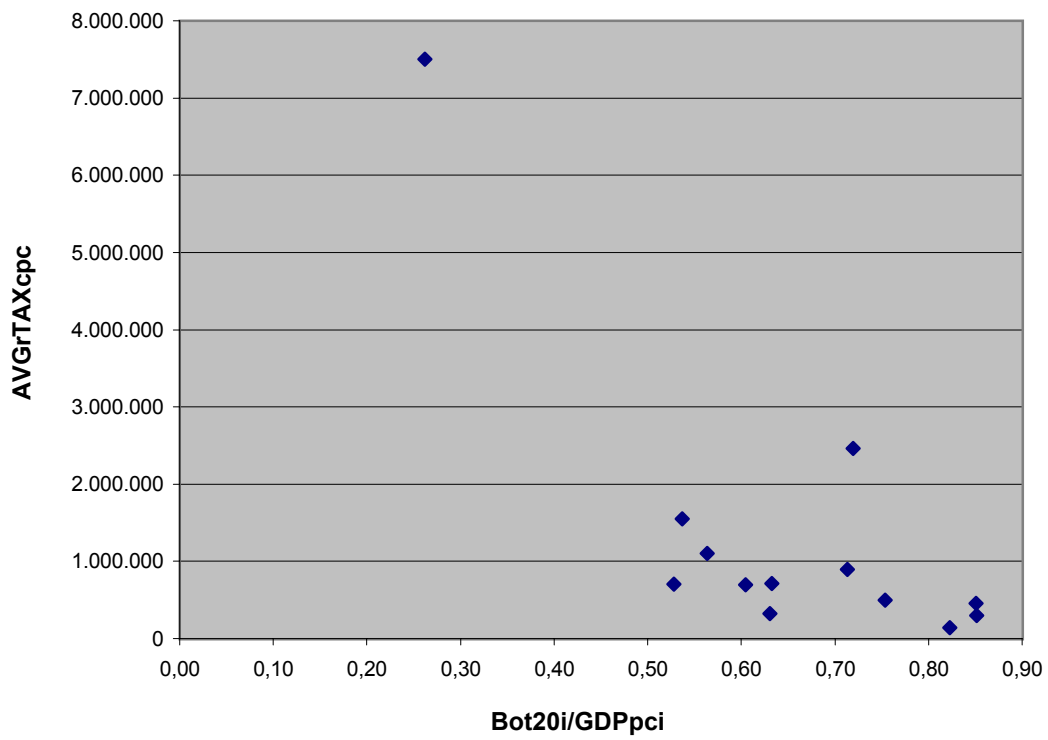
**Figure 2.6**



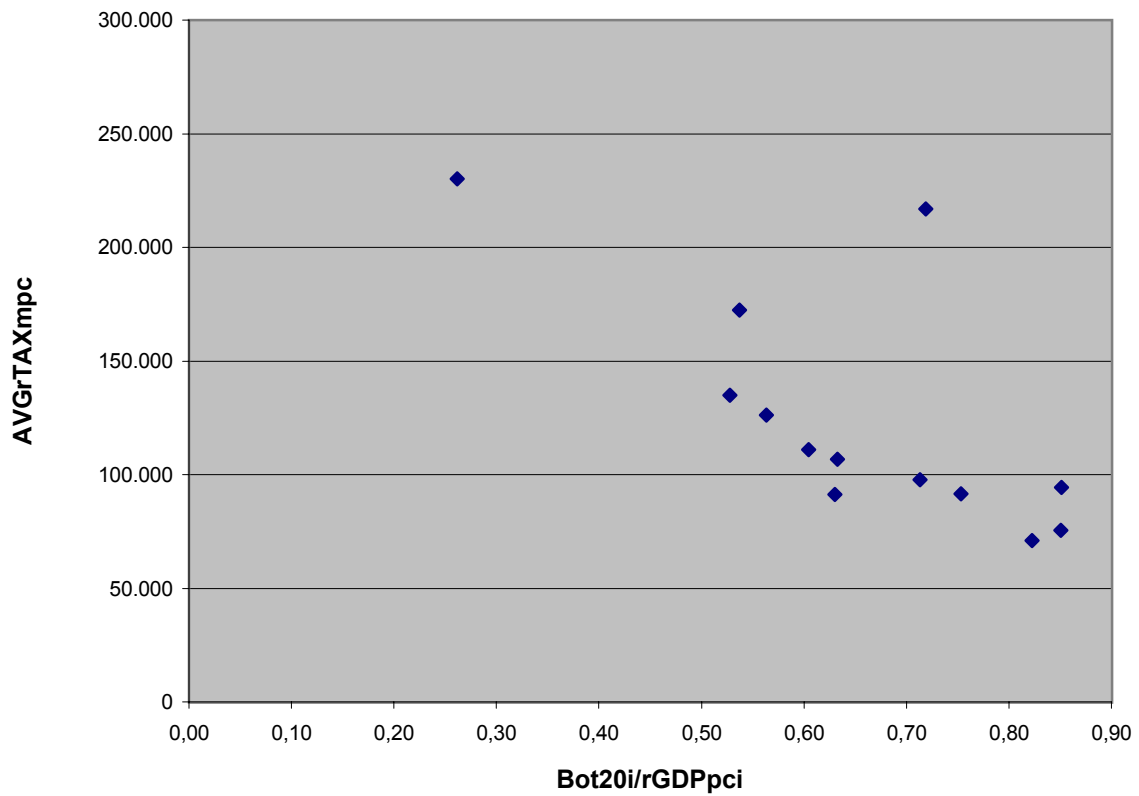
**Figure 2.7**



**Figure 2.8**

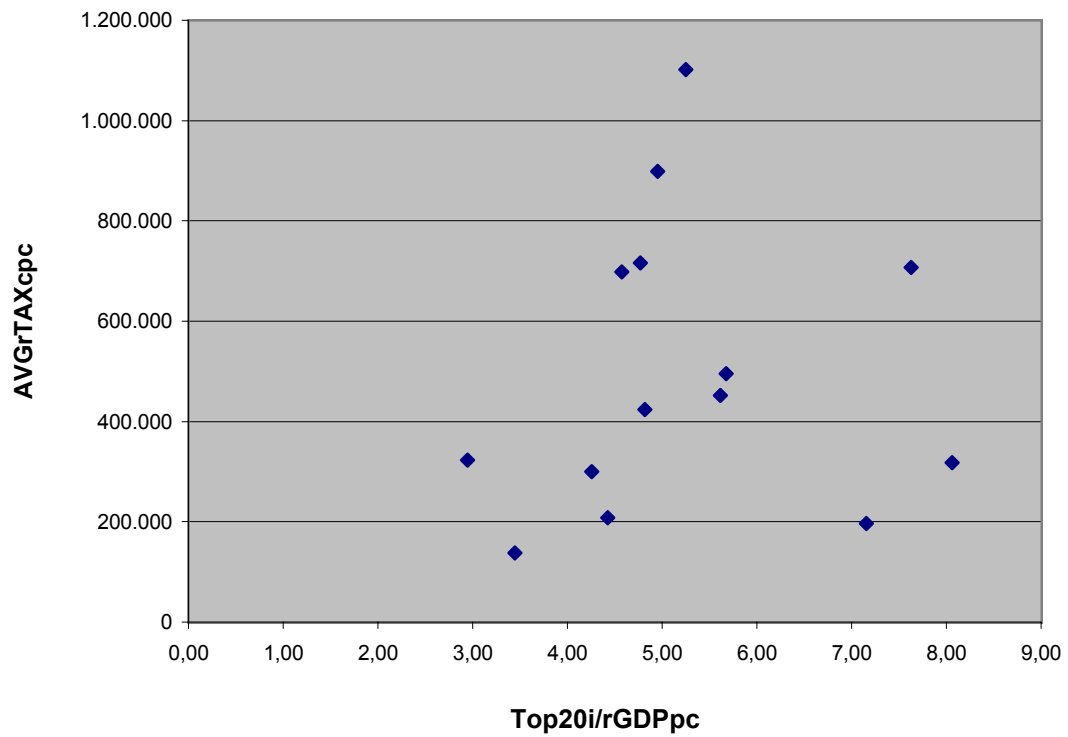


**Figure 2.9**

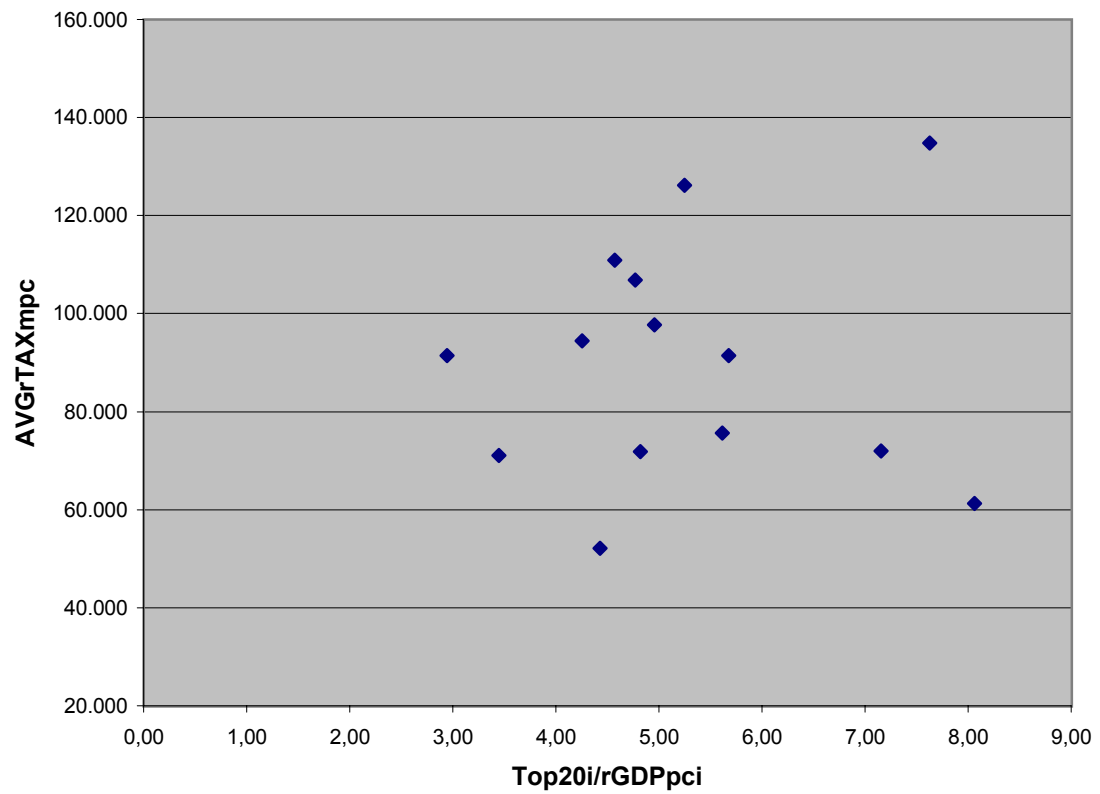




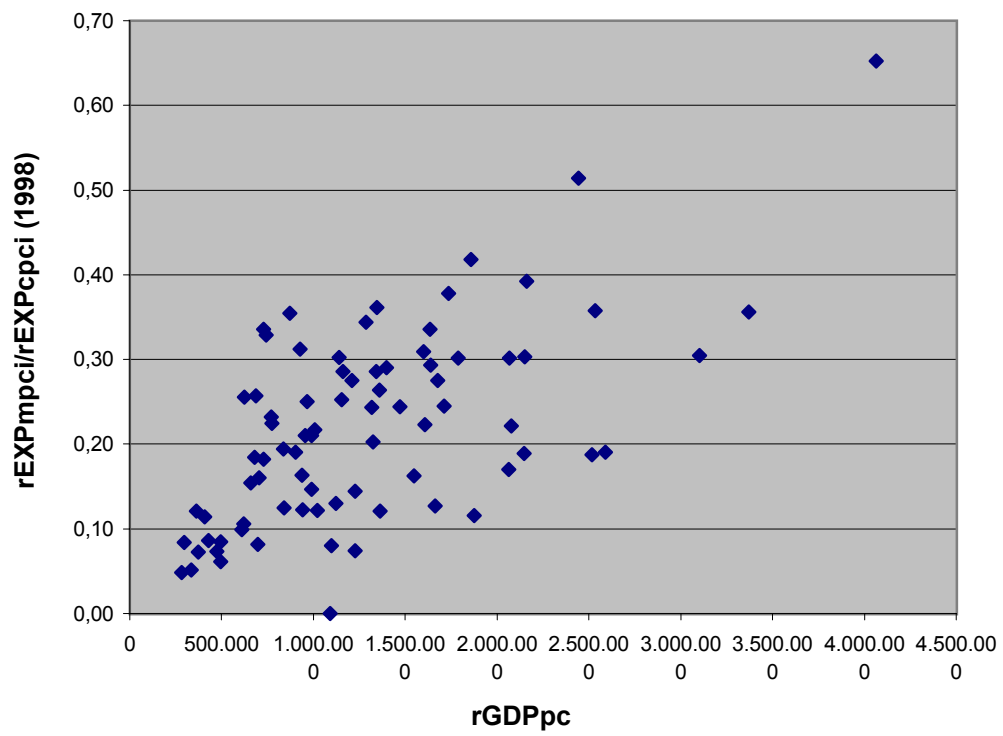
**Figure 2.10**



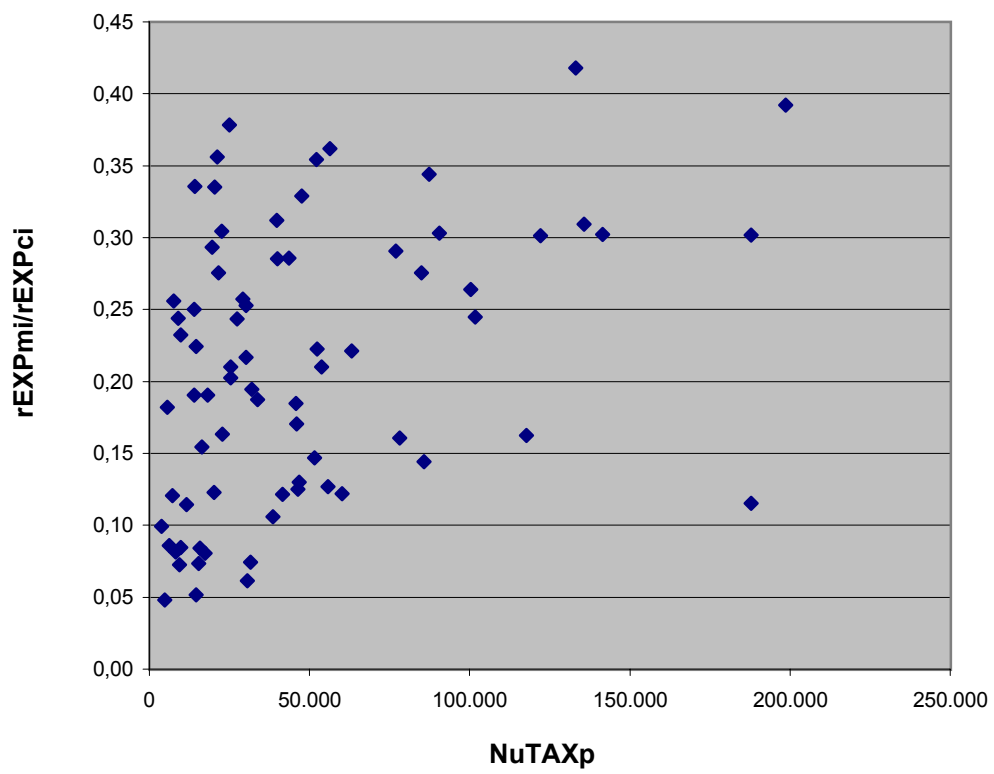
**Figure 2.11**



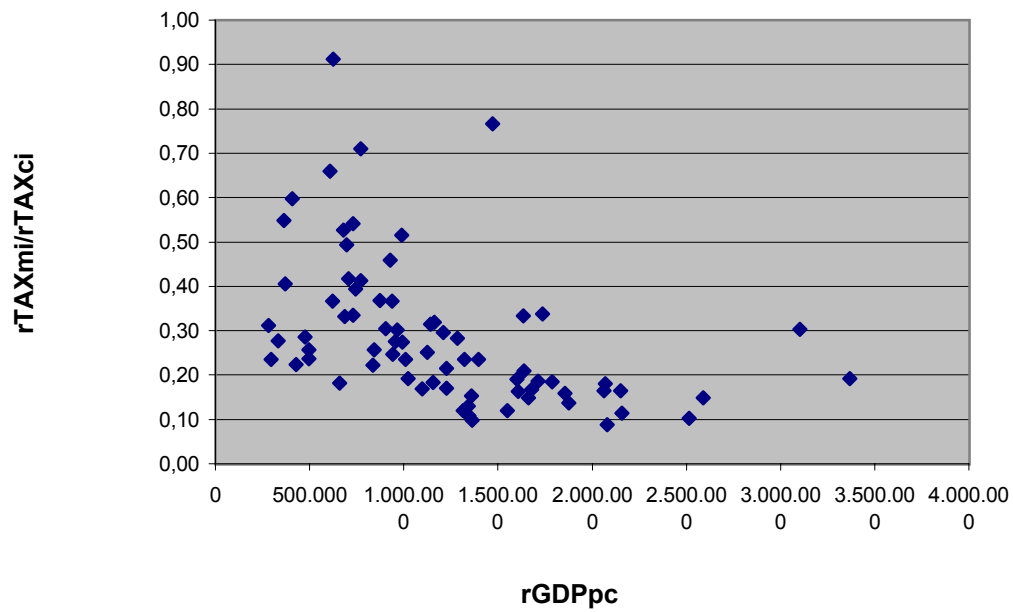
**Figure 3.1**



**Figure 3.2**



**Figure 3.3**



**Figure 3.4**

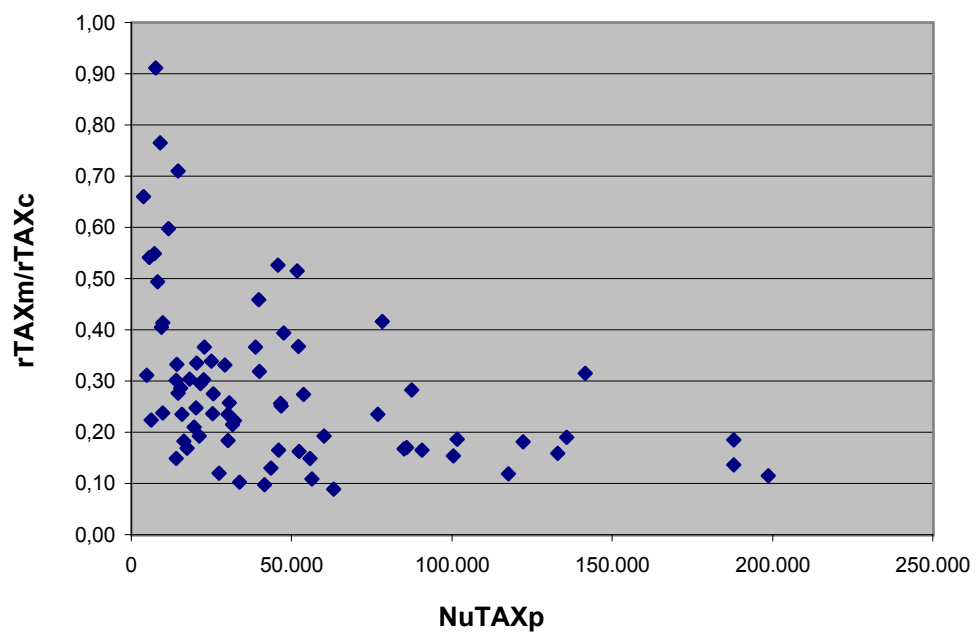


Figure 4.1

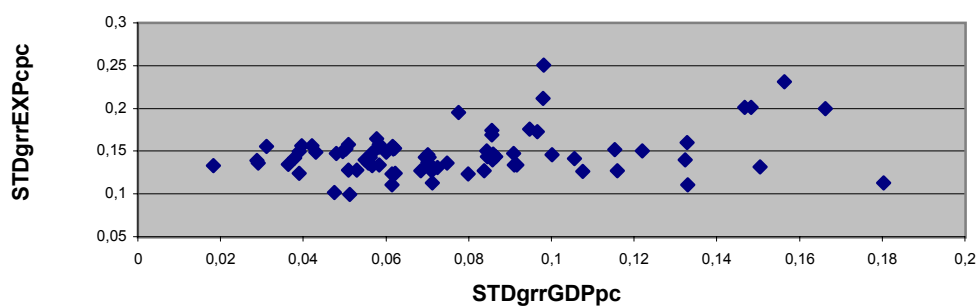


Figure 4.2

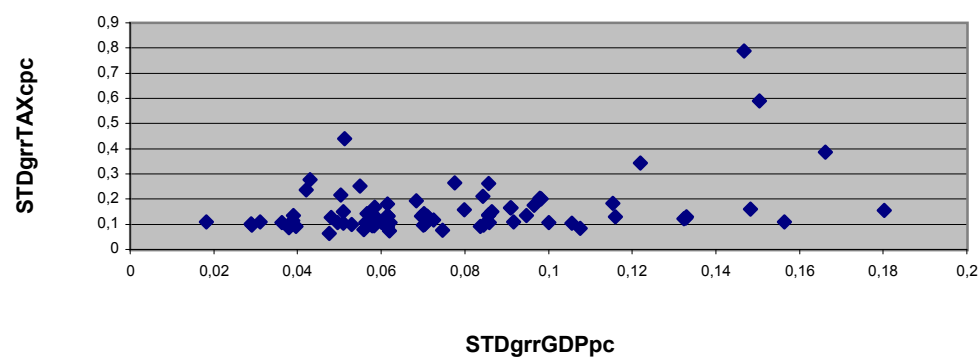


Figure 4.3

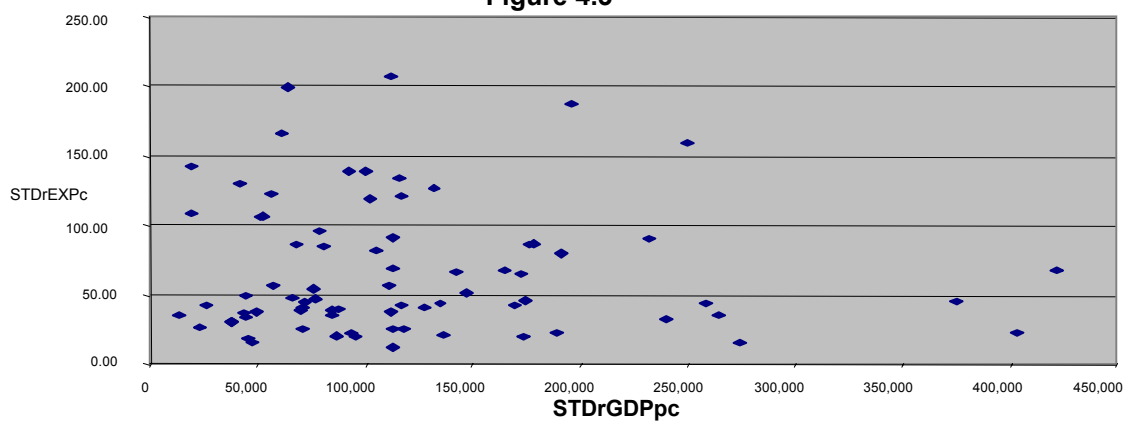
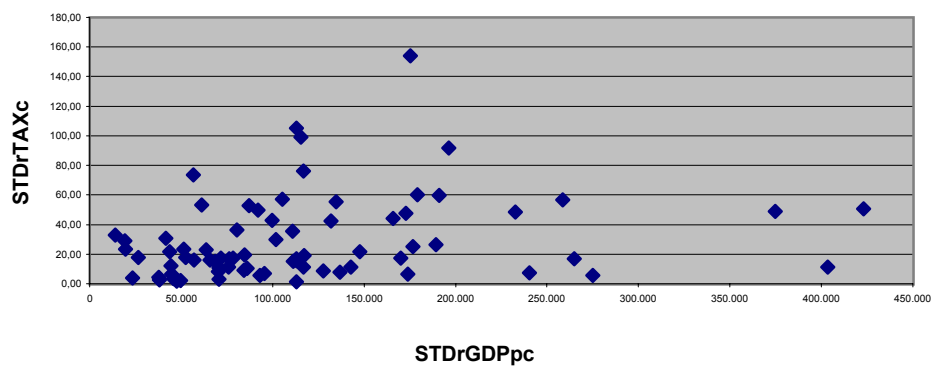
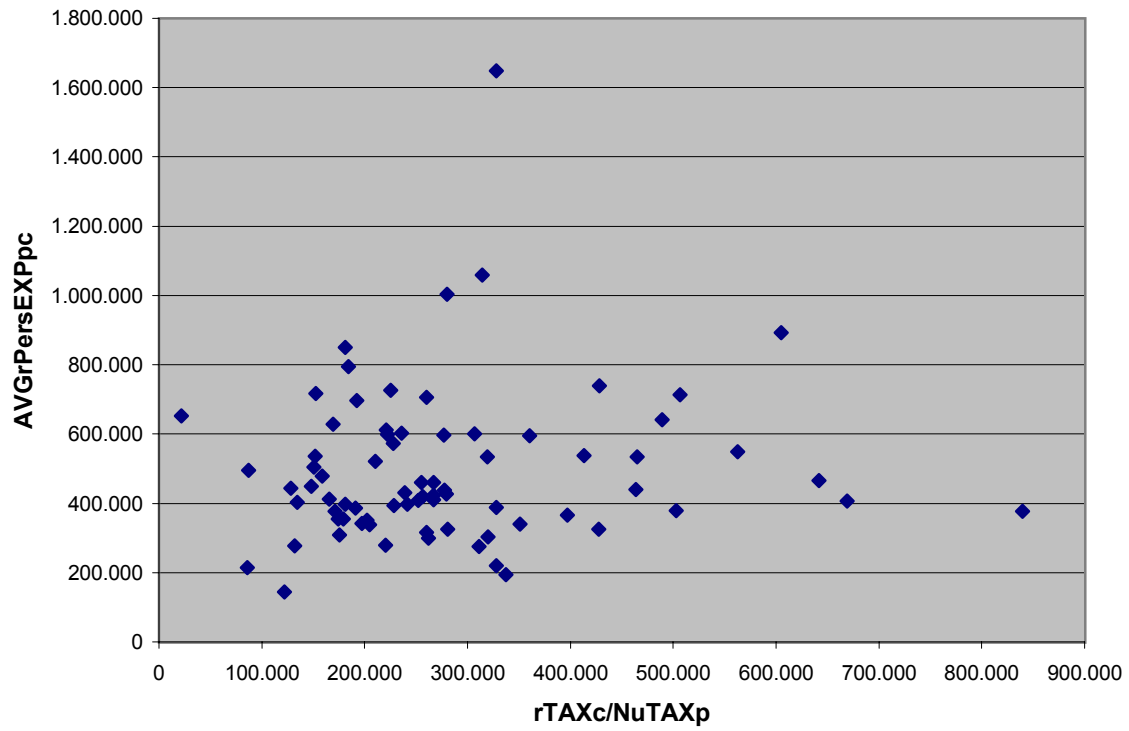


Figure 4.4

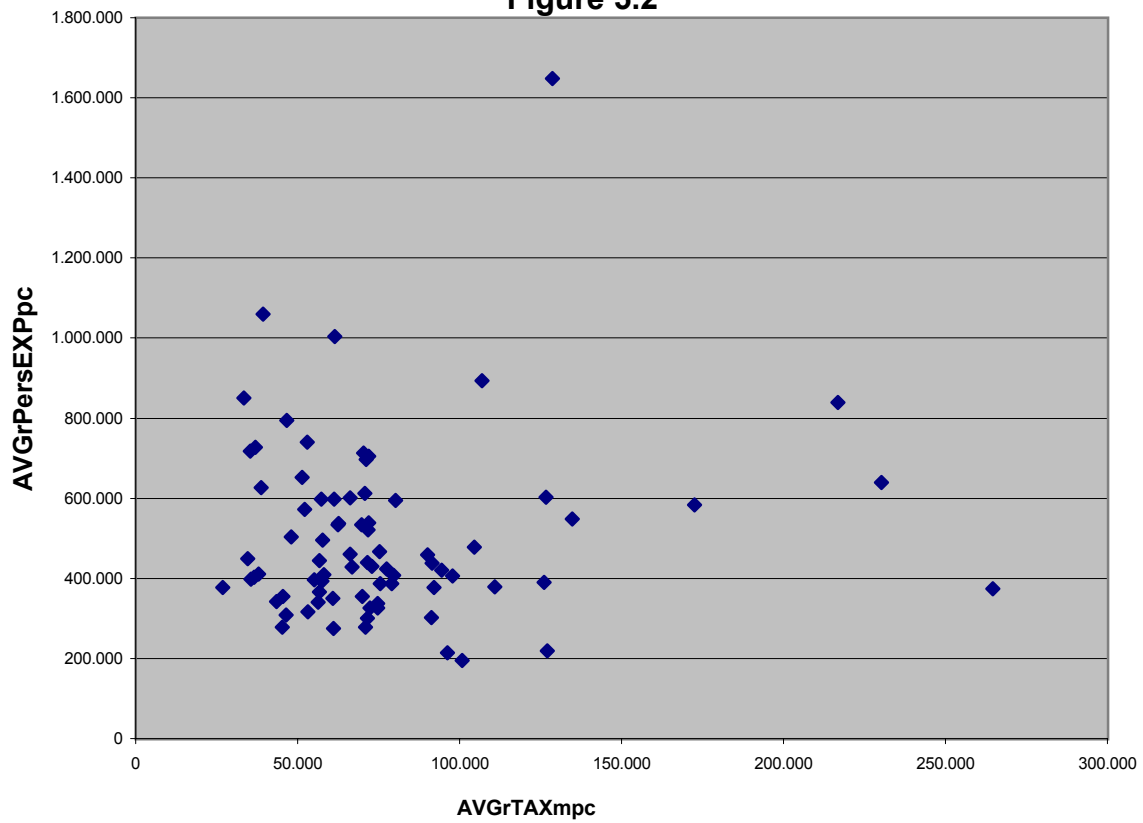




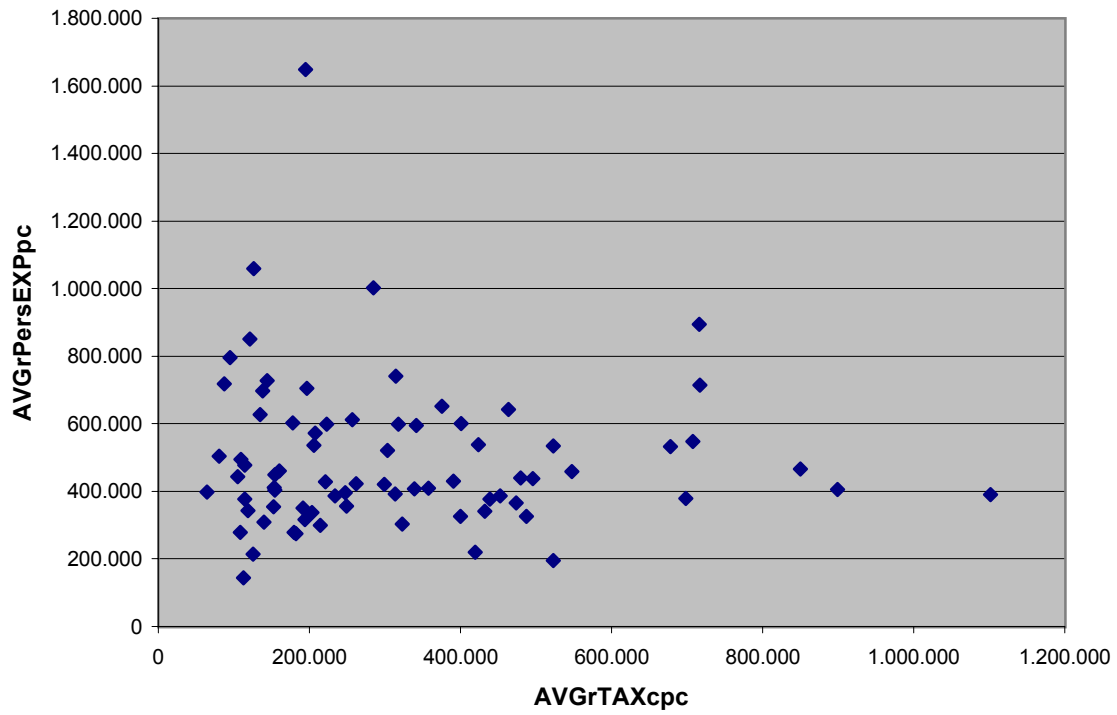
**Figure 5.1**



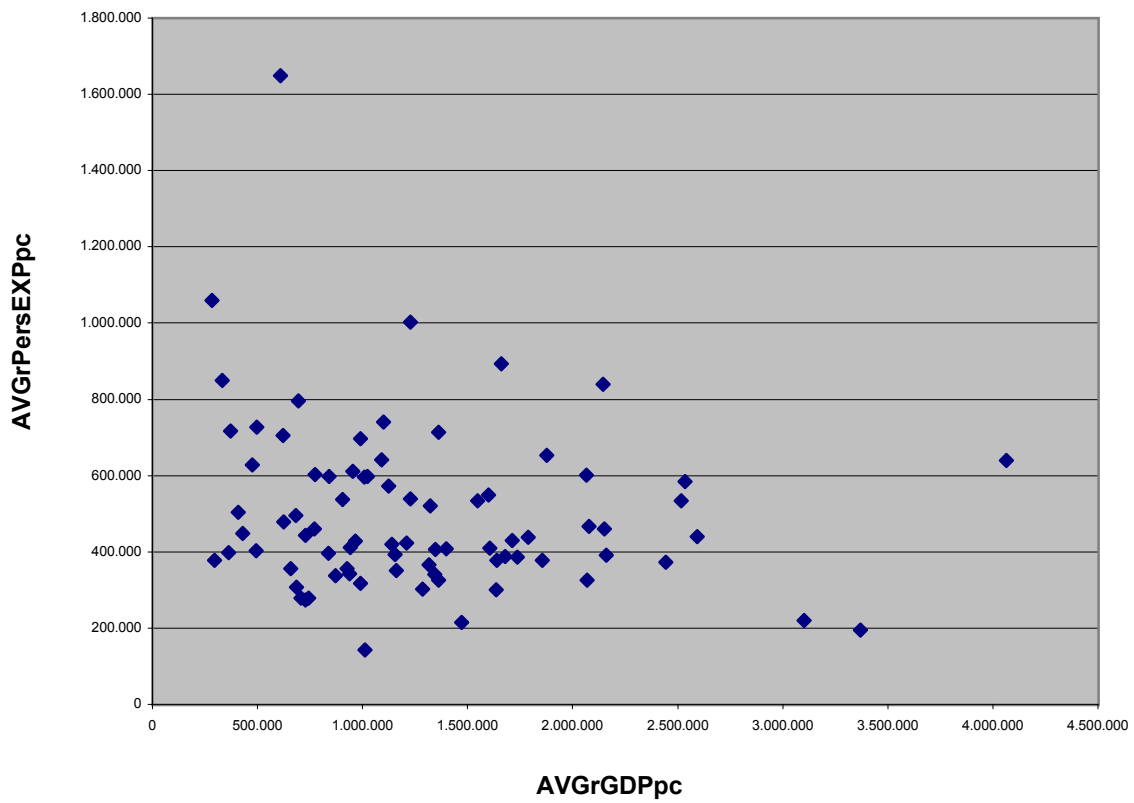
**Figure 5.2**



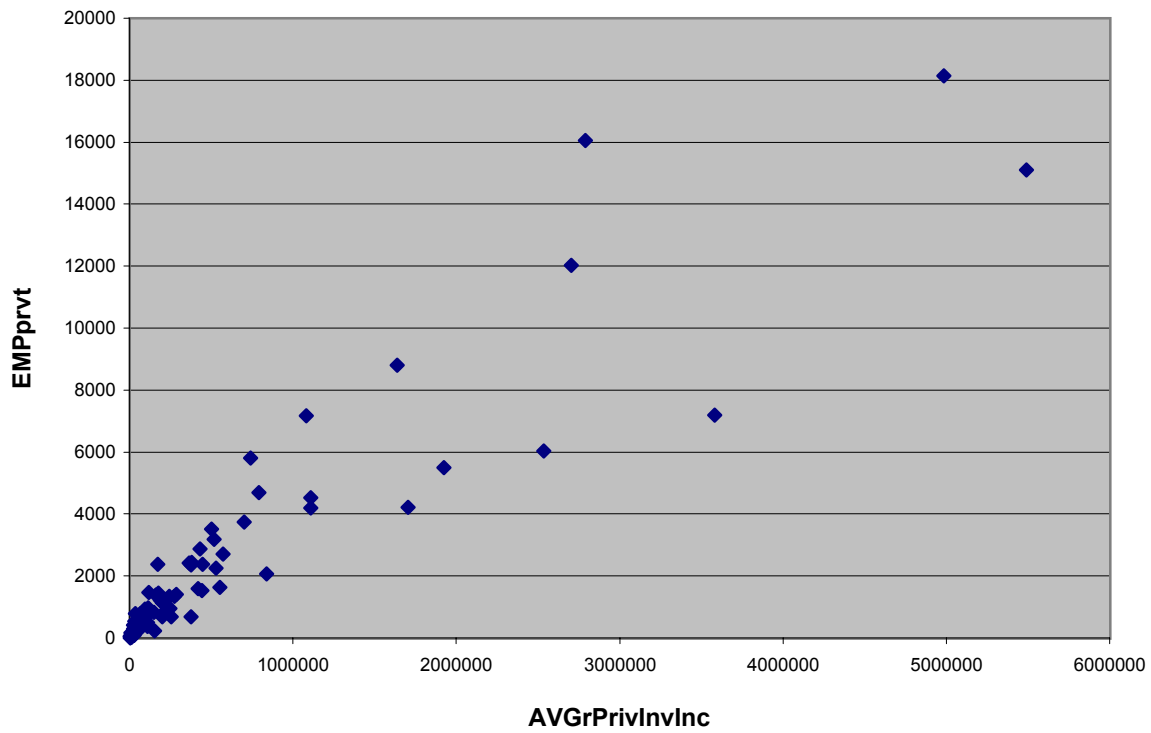
**Figure 5.3**



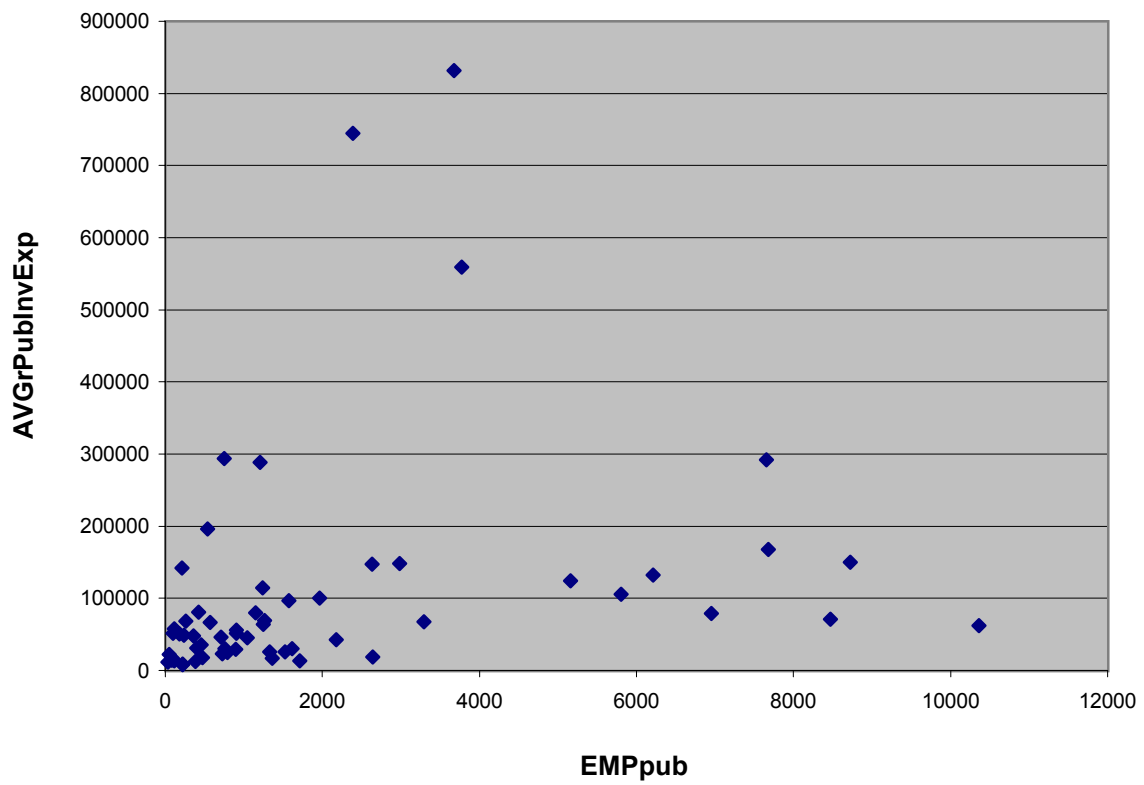
**Figure 5.4**



**Figure 6.1**

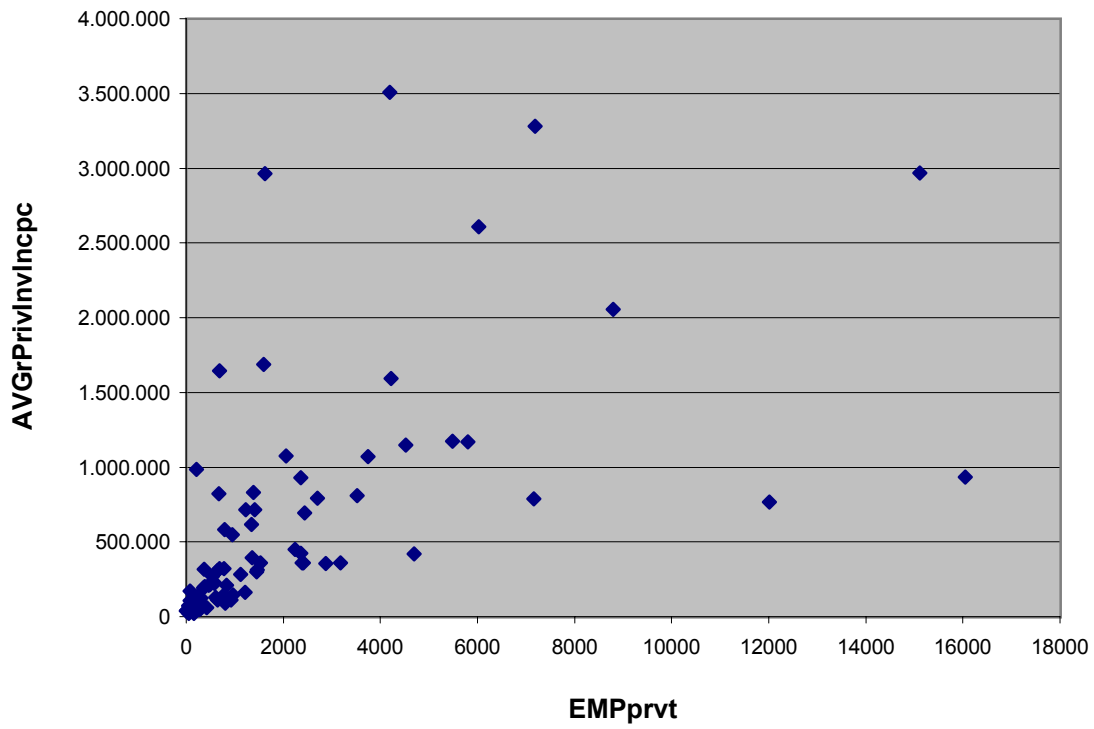


**Figure 6.2**

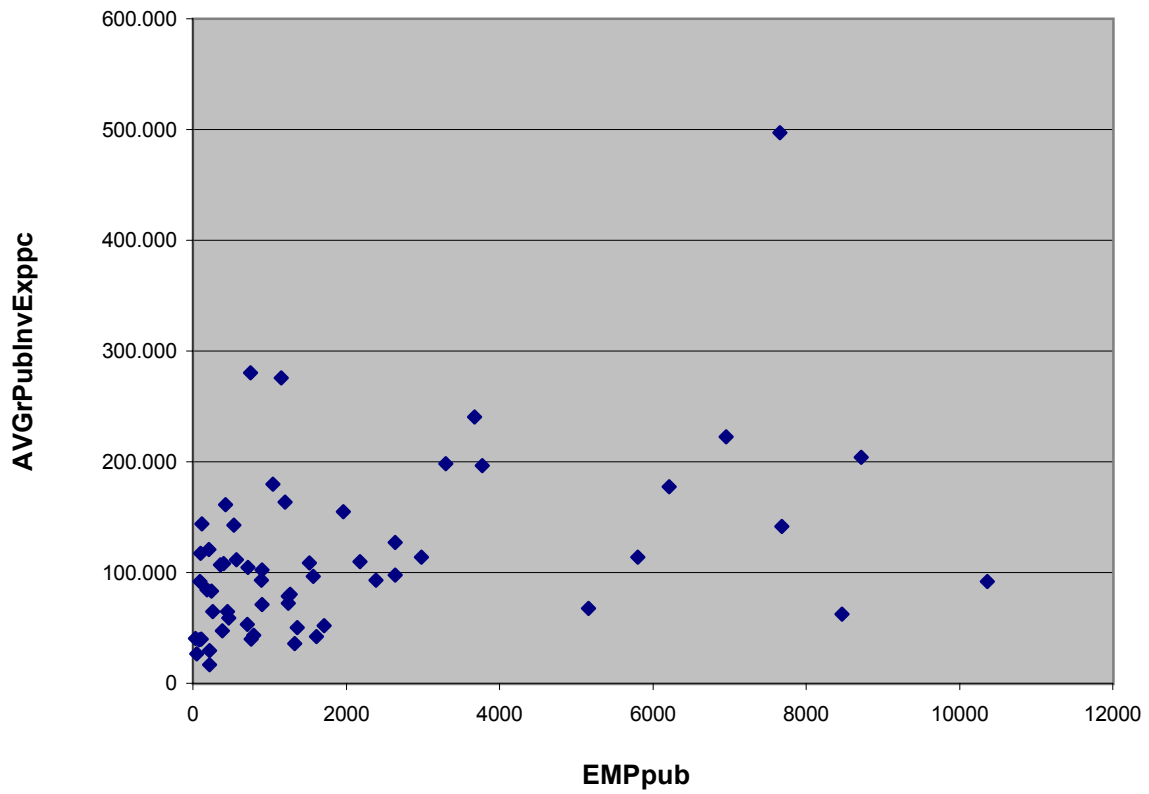




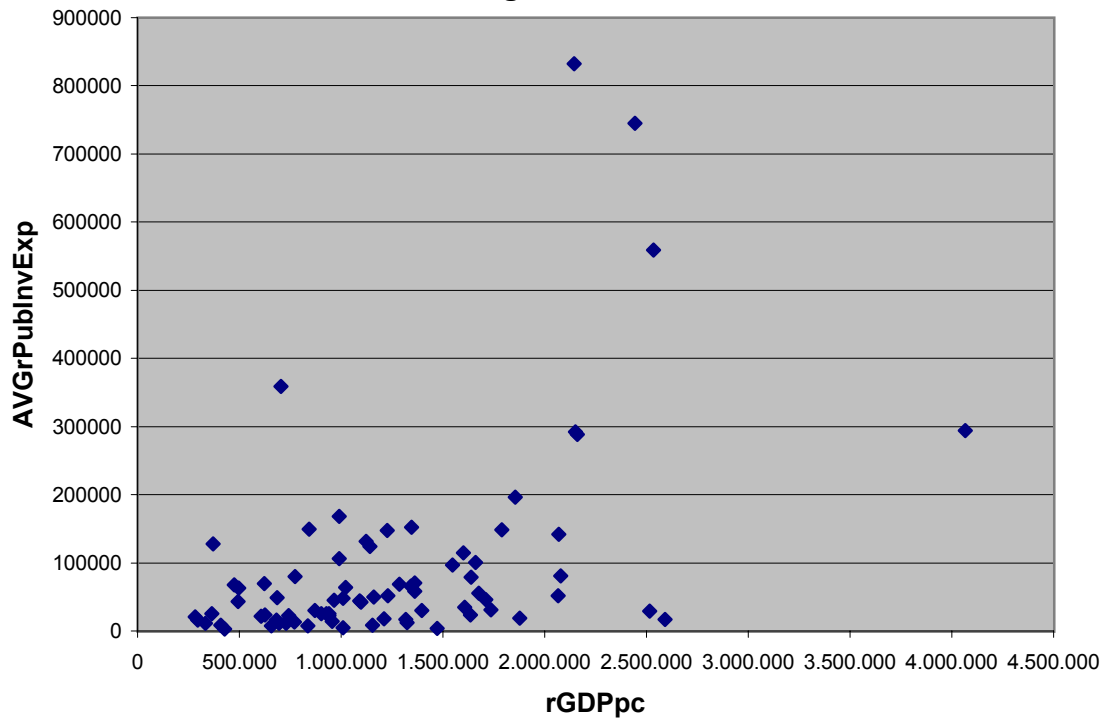
**Figure 6.3**



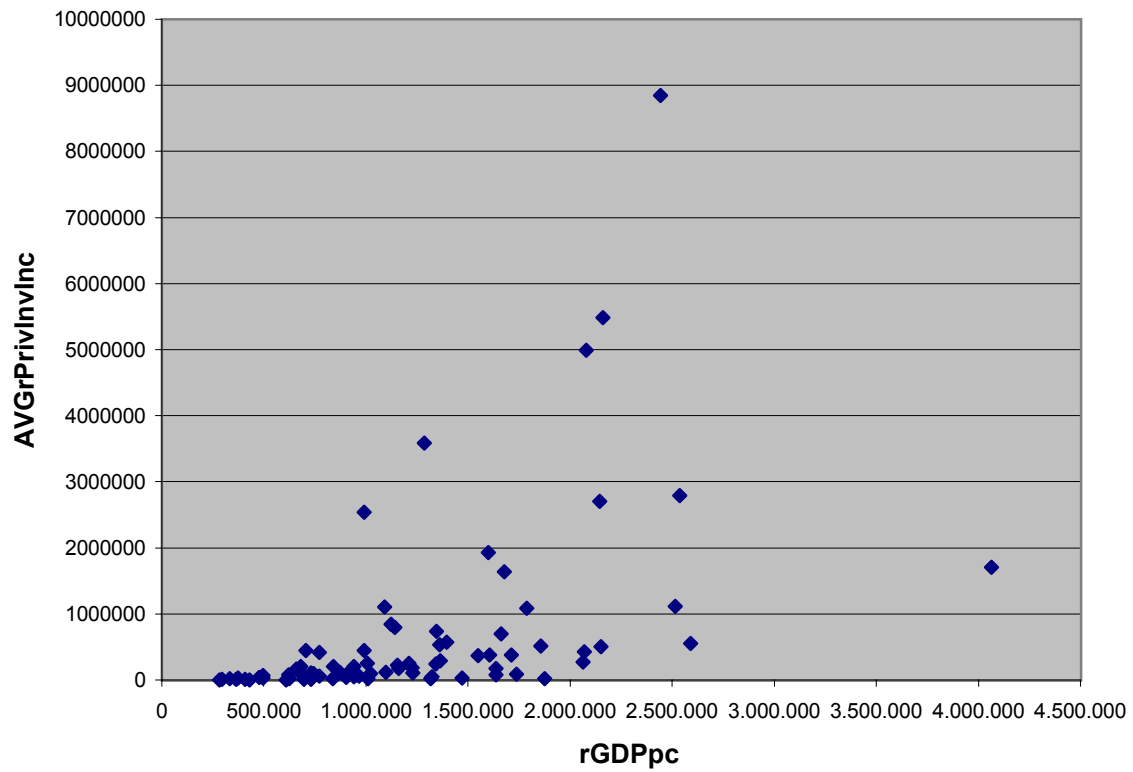
**Figure 6.4**



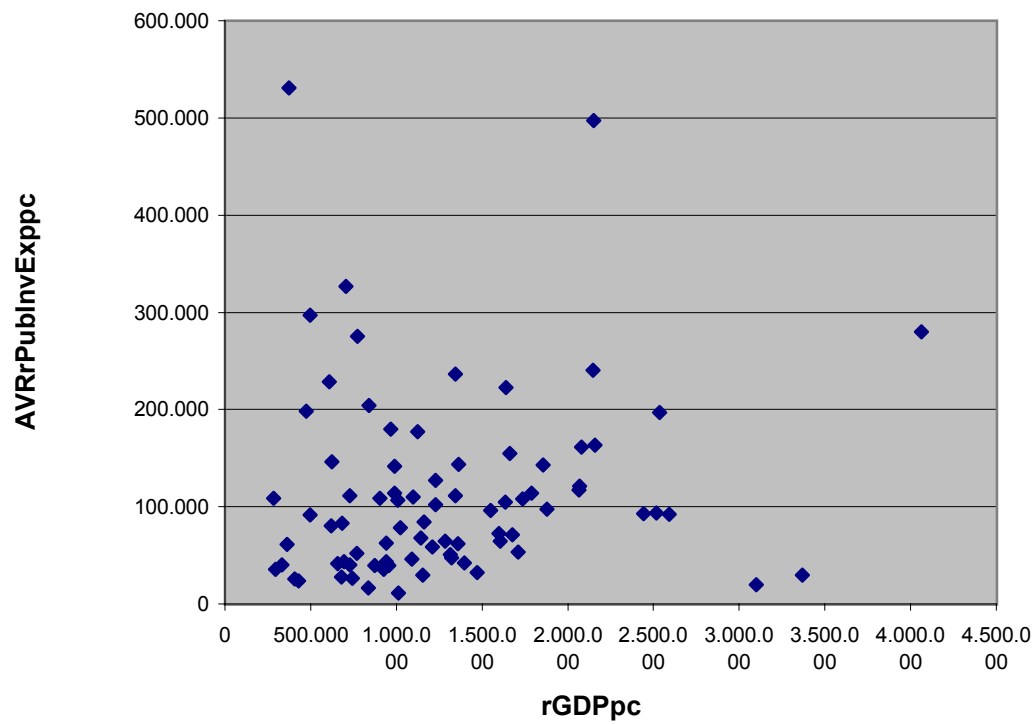
**Figure 6.5**



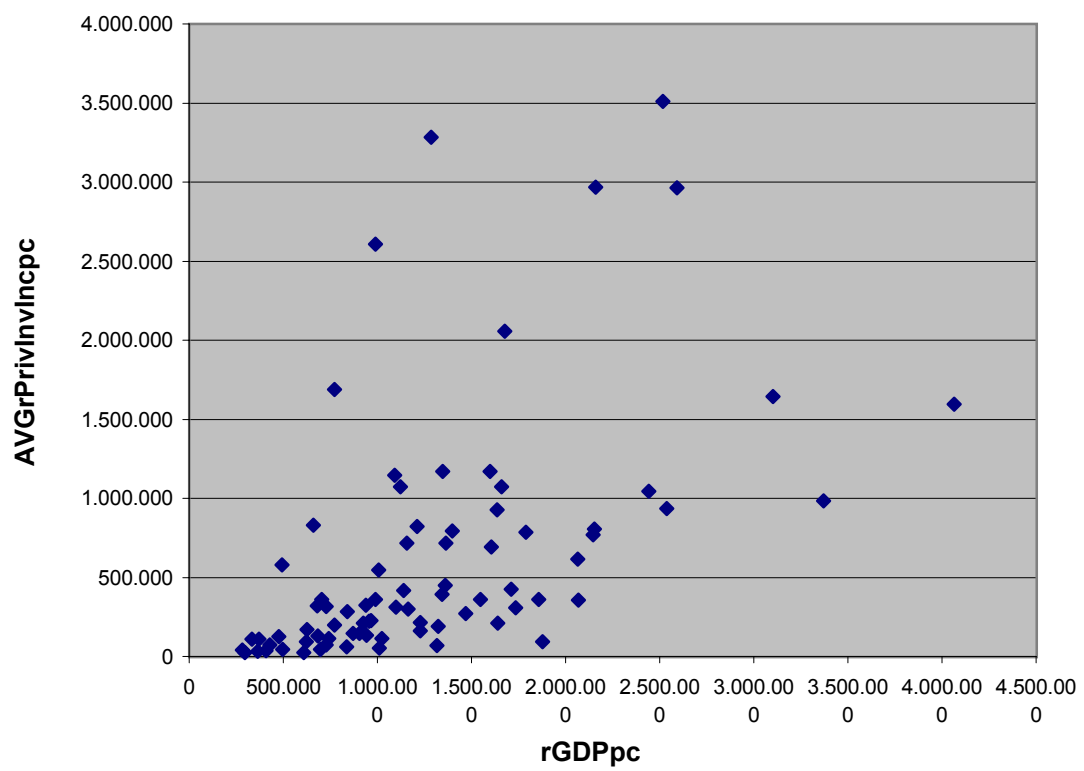
**Figure 6.6**



**Figure 6.7**

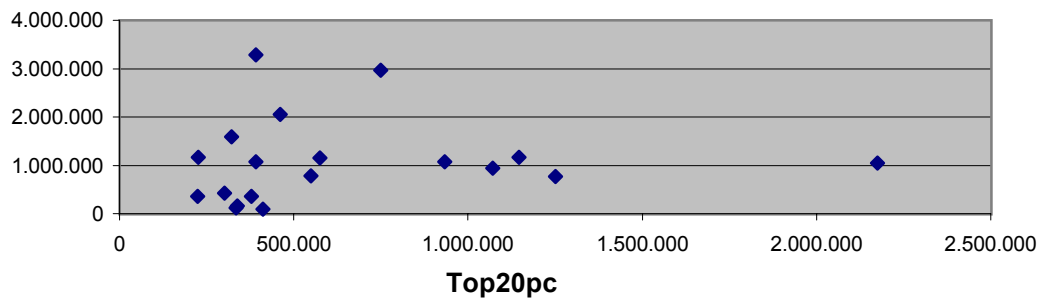


**Figure 6.8**



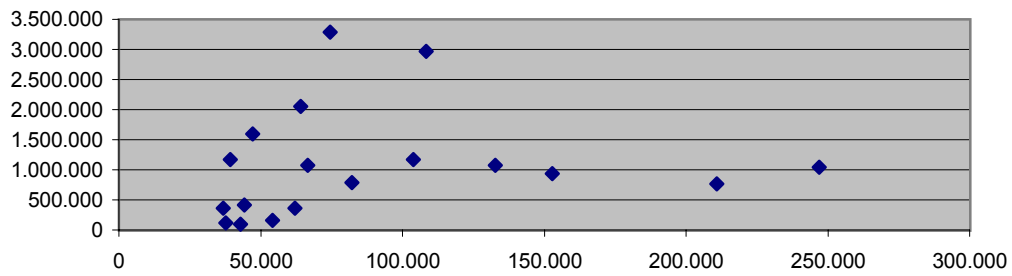
AVGPrvInvIncp

Figure 6.9



AVGPrvInvIncp

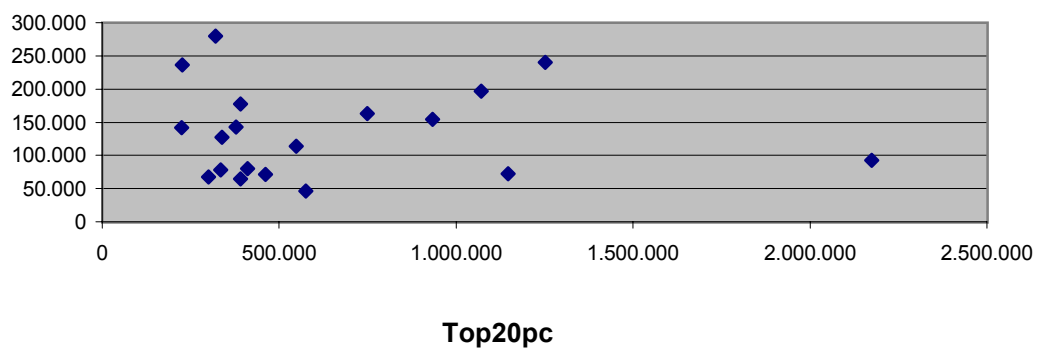
Figure 6.10



Bot20pc

AVGPubInvExppc

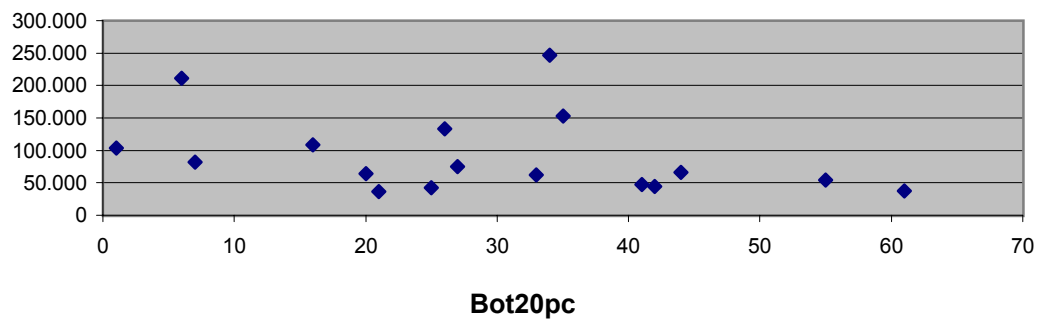
Figure 6.11



Top20pc

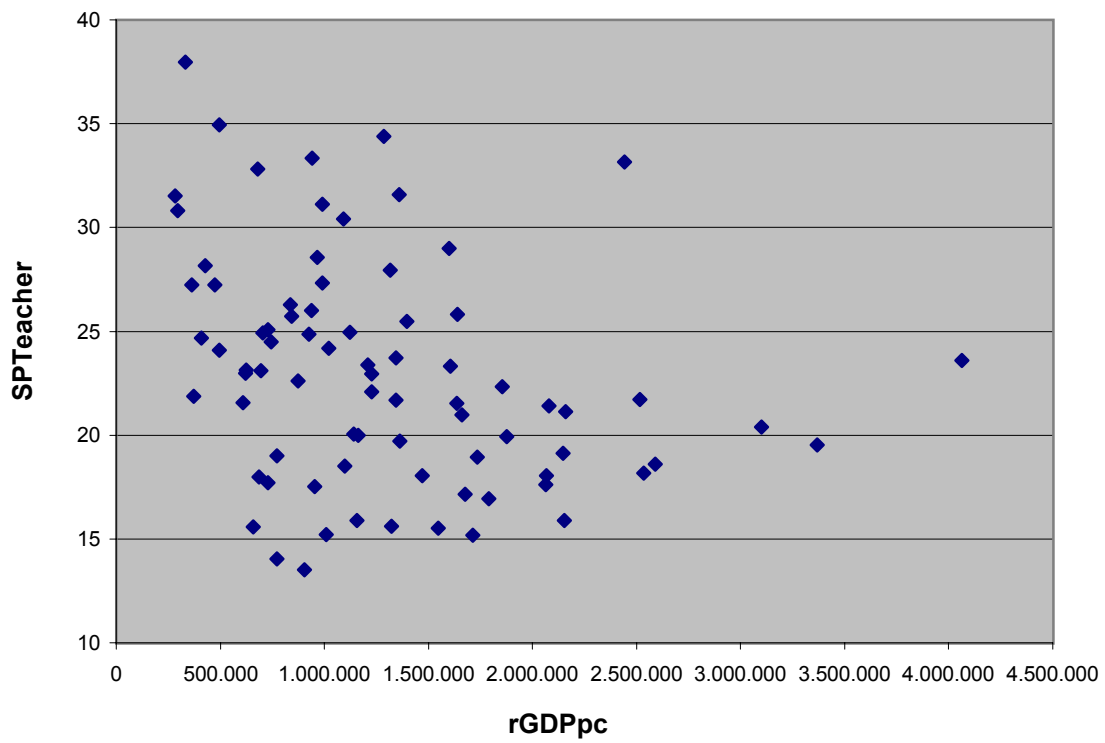
AVGPrvInvIncp

Figure 6.12

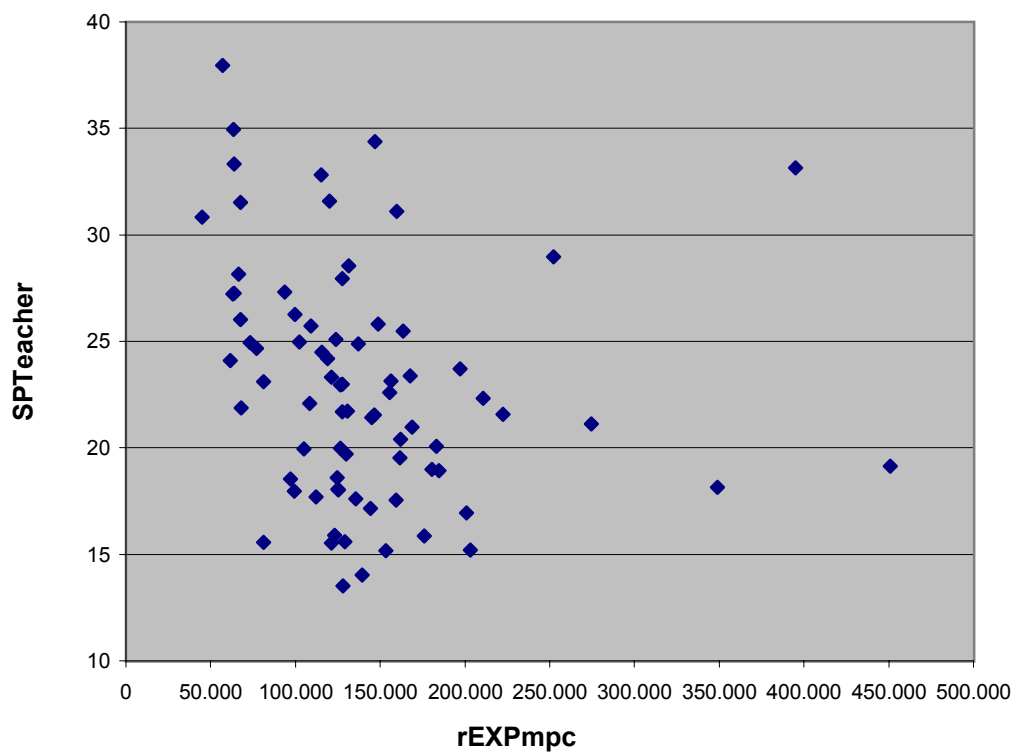


Bot20pc

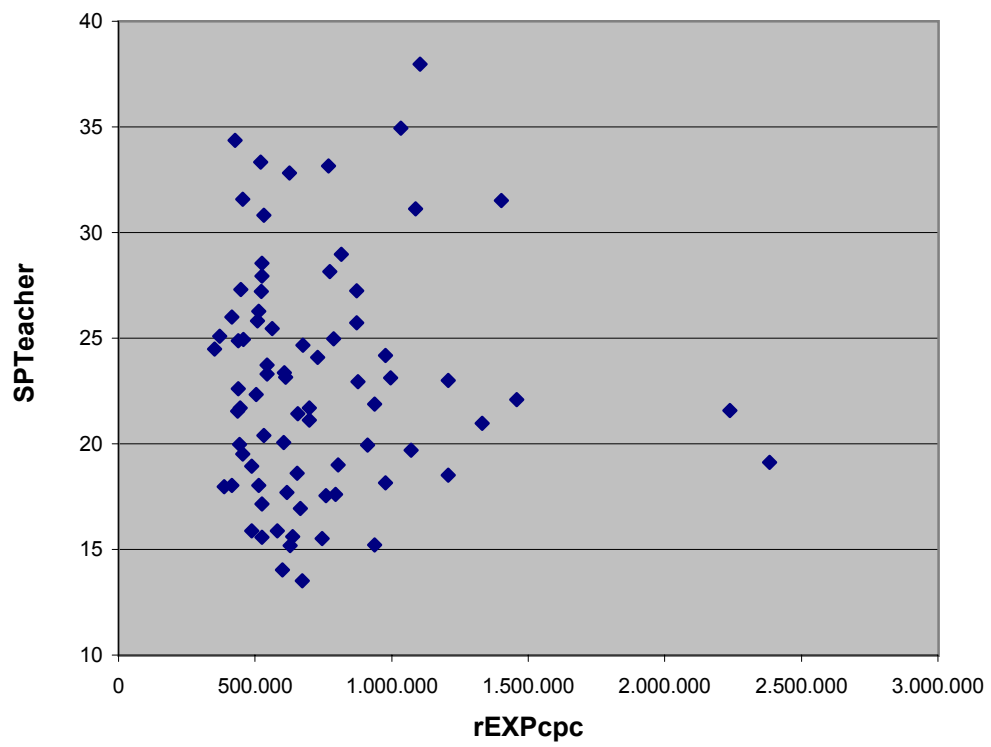
**Figure 7.1**



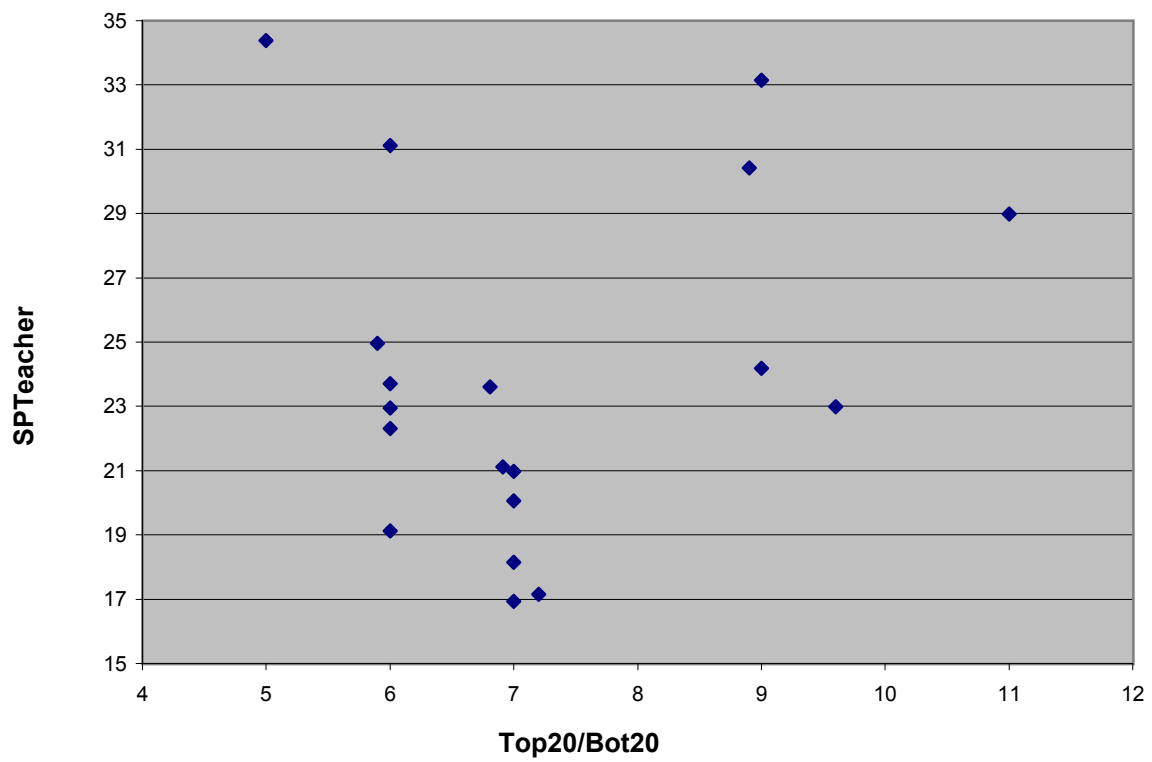
**Figure 7.2**



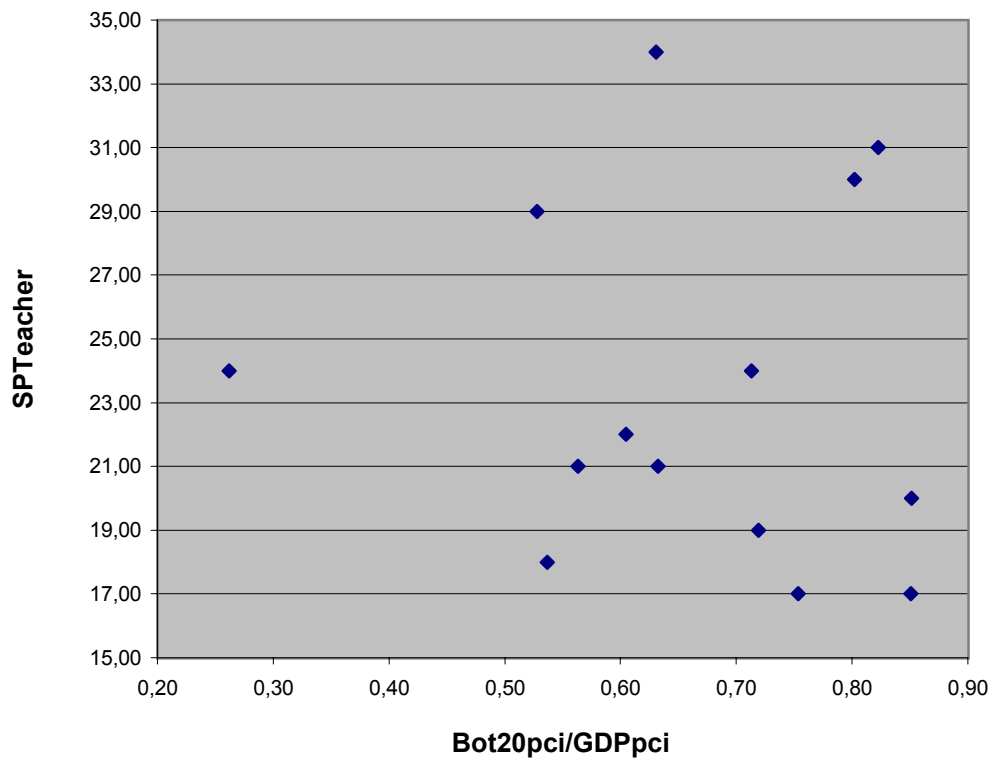
**Figure 7.3**



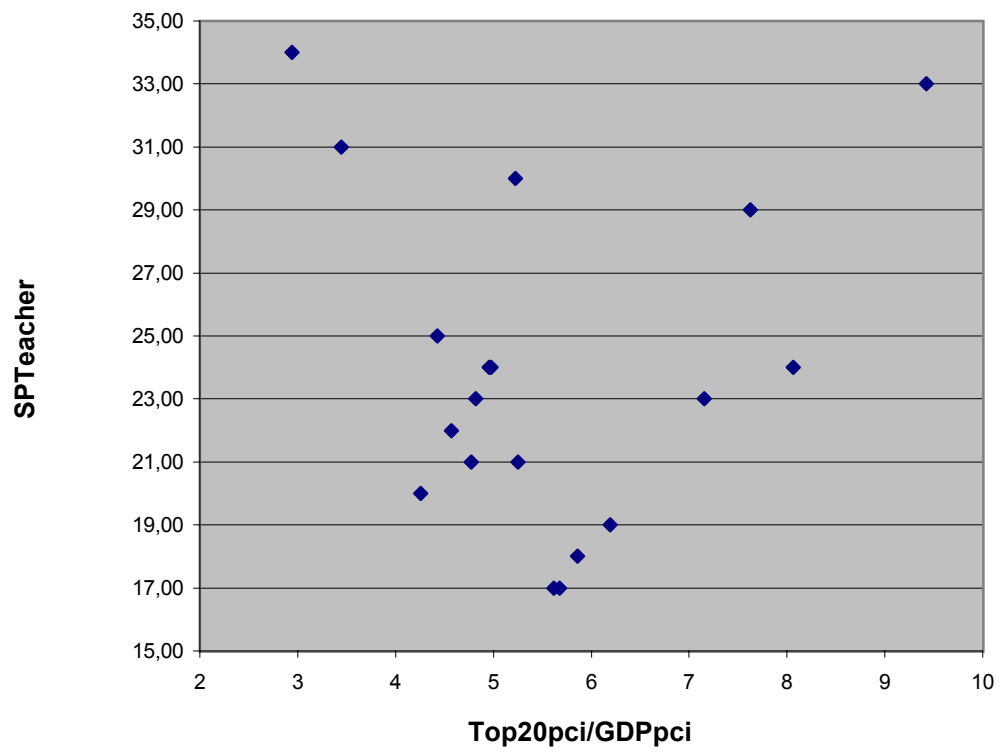
**Figure 7.4**



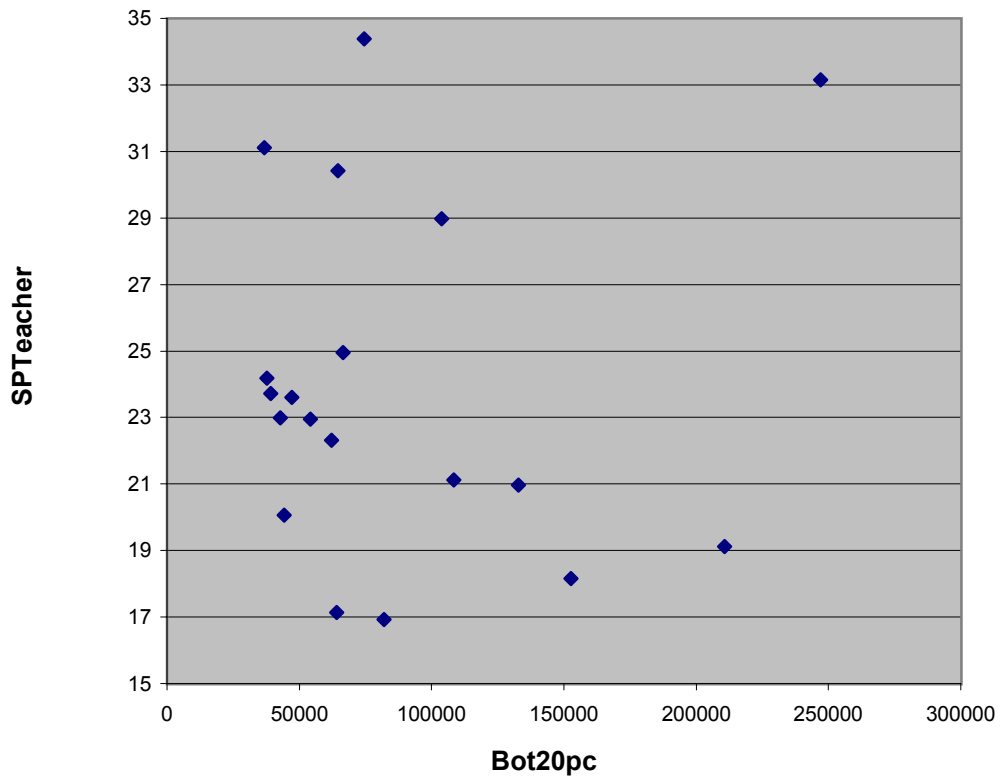
**Figure 7.5**



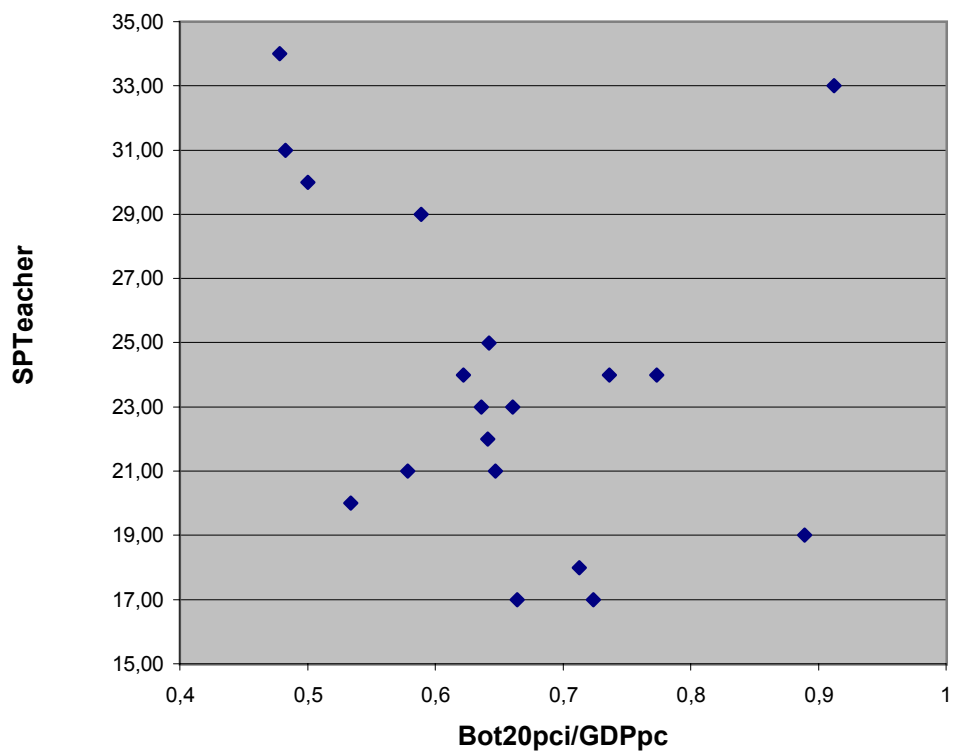
**Figure 7.6**



**Figure 7.7**

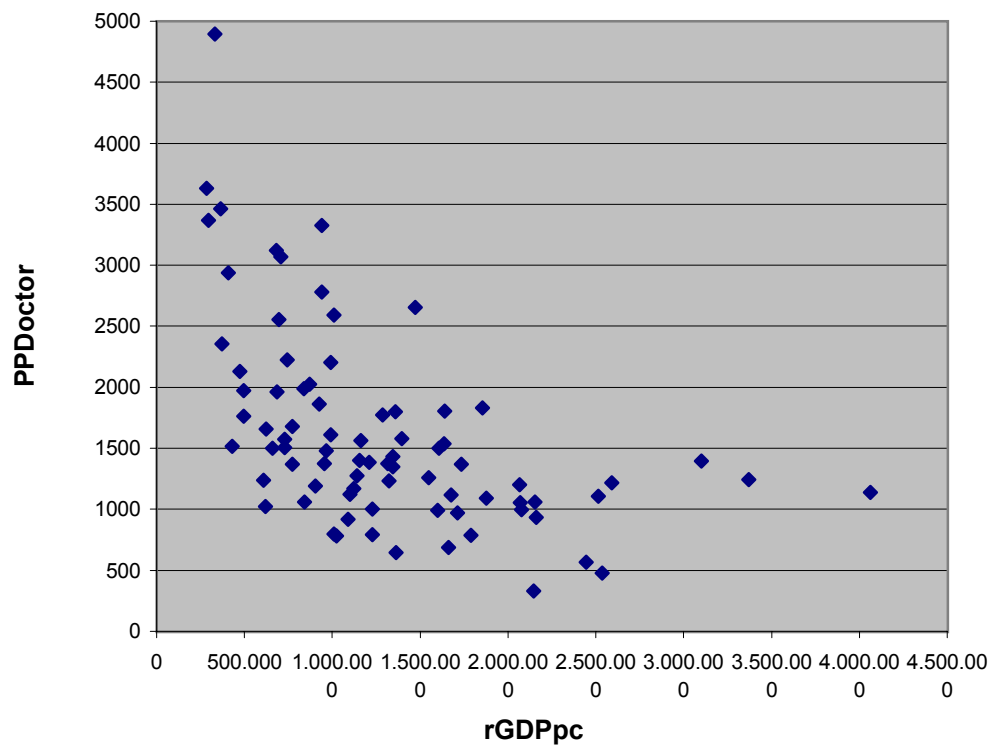


**Figure 7.8**





**Figure 7.9**



**Figure 7.10**

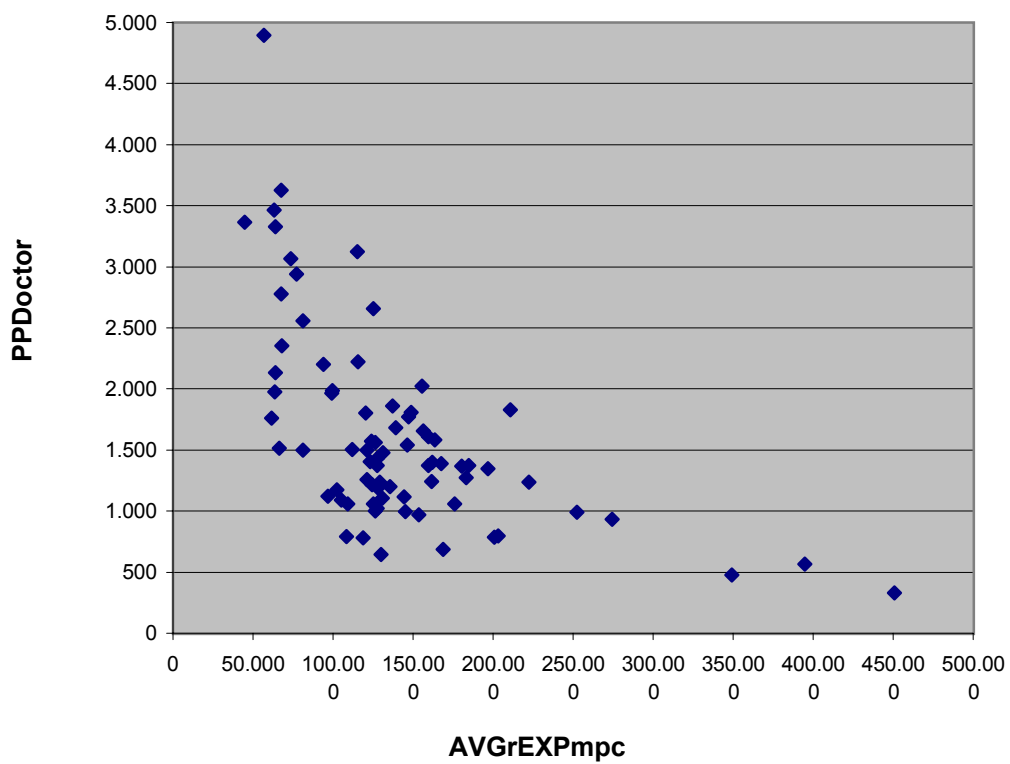


Figure 7.11

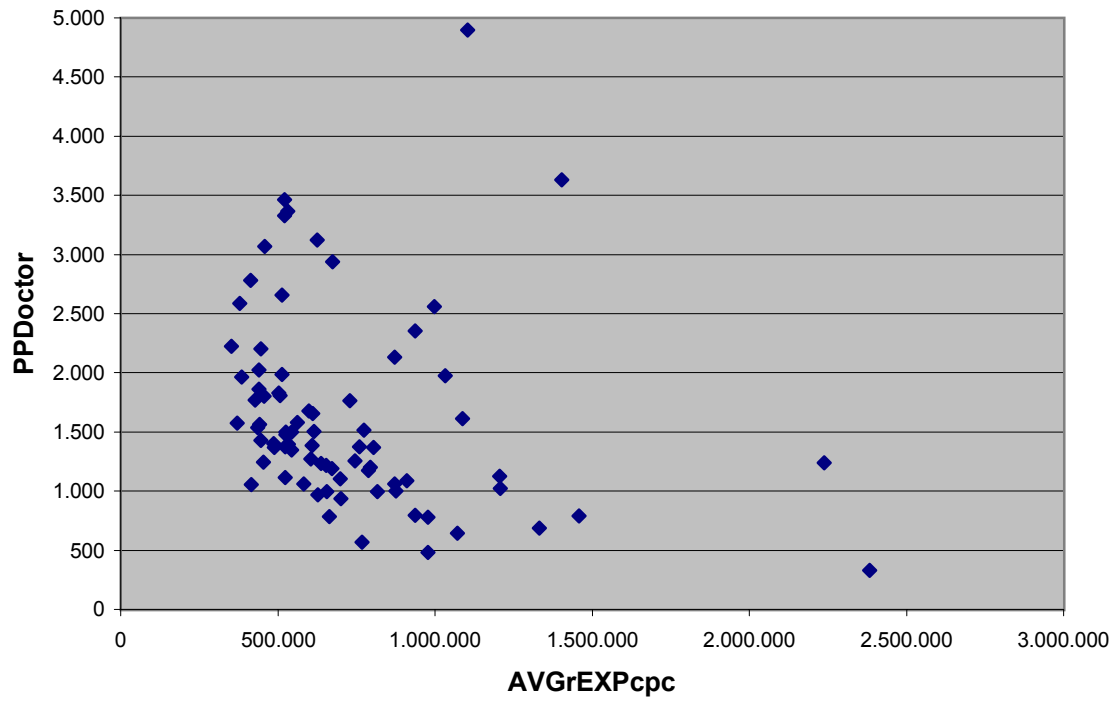
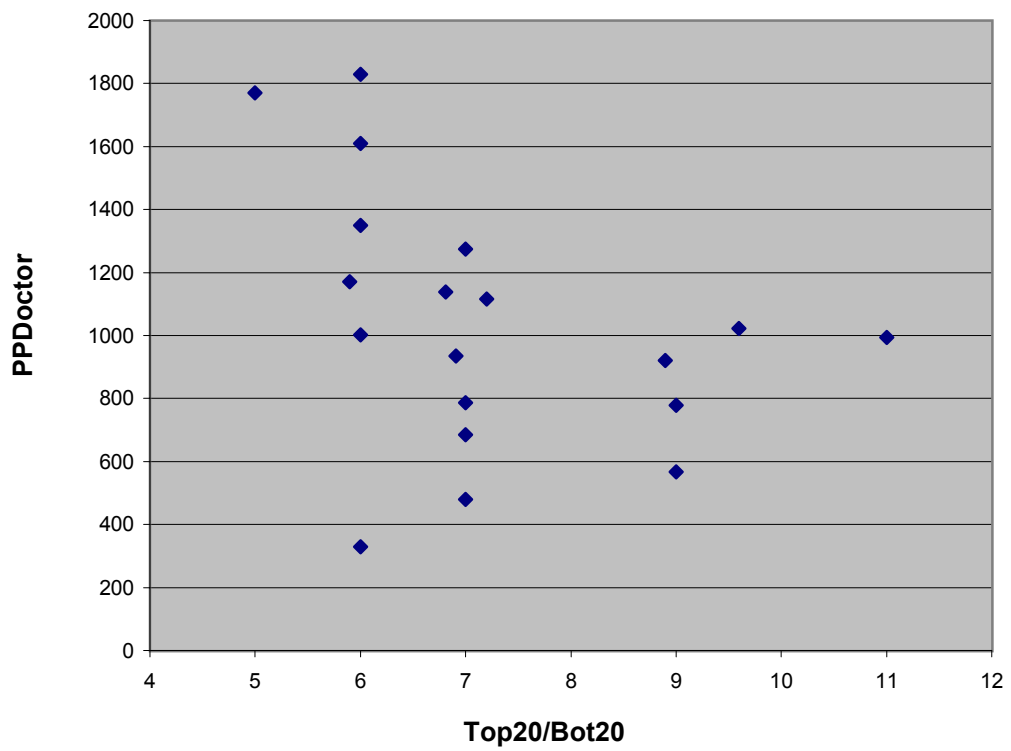
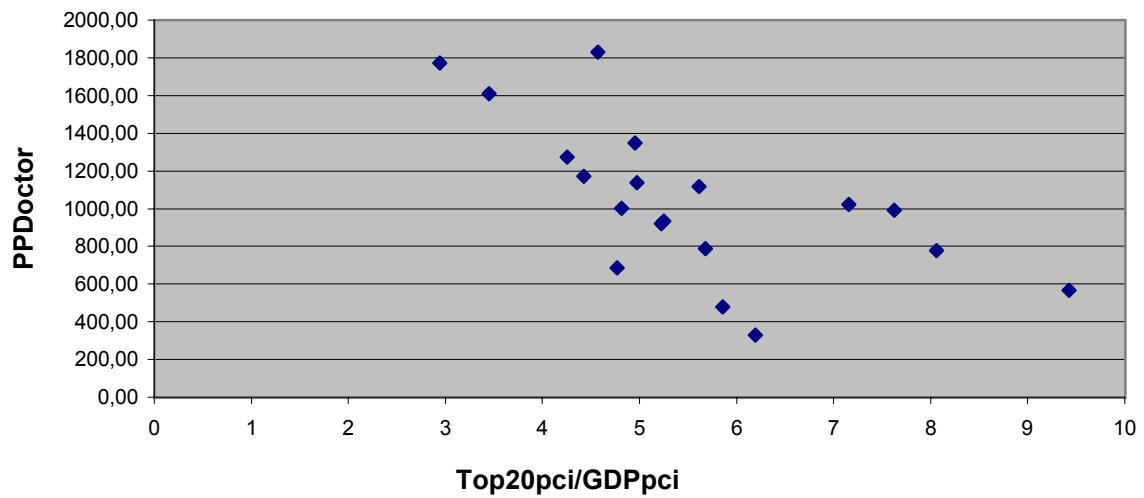


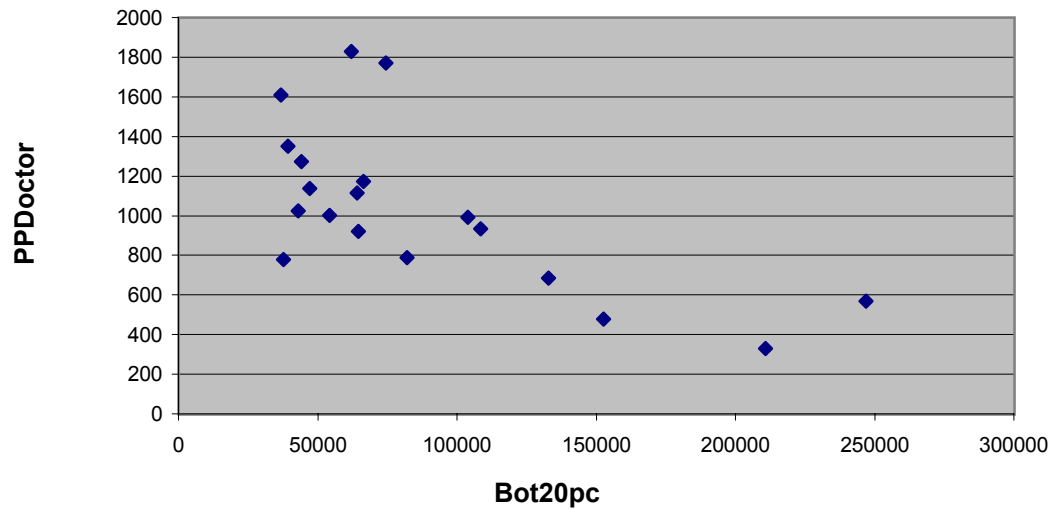
Figure 7.12



**Figure 7.13**



**Figure 7.14**



**Figure 7.15**

